Industrial Standardization

and Commercial Standards Monthly

Executive Edition

- "The use of effective standards is one of the most reliable tools an executive can have to reduce the pressure under which he lives"
  —*Howard Coonley (page 133)*
- Advisory Committee of Executives *(page 137)*

June 1939

"One of the outstanding aids to management in its search for more efficient methods is the contribution of standardization. An increased use of standardization may be our solution today. Its use has contributed more than any other thing to the high standards of living in this country, standards which are higher than those in any other part of the world.

"Industry is grateful for the work of an organization like the American Standards Association."—*W. L. Batt, president, SKF Industries.*

"The adoption of standards is a highly important factor in preparedness of our country for national defense. The value of the work of the American Standards Association in developing and establishing standards in industry is thoroughly appreciated."—*Louis Johnson, Assistant Secretary of War.*

"For a number of years the Industrial Accident Commission of California has based its safety requirements on national standards, using American Standard safety codes whenever they have been available."—*C. H. Fry, chief, Bureau of Industrial Accident Prevention, California State Industrial Accident Commission.*

"The American Standards Association provides standards made by and acceptable to industry where standards are needed, without limiting in the slightest degree the special designs or material required for the proper working of an individual industry."—*Ralph E. Flanders, president, Jones & Lamson Machine Company.*

"The ASA Code Z9 on factors involved in the fundamental design of exhaust systems is a bible for any engineer who delves into this phase of the work."—*W. G. Hazard, Owens-Illinois Glass Company.*

"It is obviously most desirable to utilize, as fully as possible, the standards which have been adopted under the procedure of the American Standards Association, a procedure which has been given very careful consideration in order to protect the interests of all parties concerned. The general use of such standards by member companies of the Association of American Railroads should ultimately assist materially in reducing costs of manufacture and time required for delivery."—*Report of Committee on Standardization of Apparatus and Material, Association of American Railroads.*

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Nat. Electrical Mfrs. Assn.
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U. S. Wood Screw Service Bureau

Company Members—Some 2,000 industrial concerns hold membership either directly or by group arrangement through their respective trade associations.

Industrial
Standardization

Combined with Commercial Standards Monthly

Published Monthly by

American Standards Association
29 West 39th Street, New York

with the cooperation of the National Bureau of Standards

RUTH E. MASON, *Editor*

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ASA

Standardization is dynamic, not static. It means not to stand still, but to move forward together.

Subscription price $4.00 per year U. S. and Canada (foreign $5.00); Special to schools and libraries $2.00 (foreign $3.00); single copies 35 cents

June, 1939 **Vol. 10, No. 6**

Mr. Coonley, who is chairman of the Board of the Walworth Company and president of the National Association of Manufacturers, is a past-president of the American Standards Association. He has been a member of the ASA Board of Directors since 1928, serving as president for three years, from 1933 through 1935.

Standards—
Effective Tool for Managerial Control

by

Howard Coonley

Chairman, ASA Advisory Committee

AFTER long experience in company operation I have been more and more impressed with the fact that the use of effective standards is one of the most reliable tools an executive can have to reduce the pressure under which he lives. I have found that this constant pressure on his time—conferences to be held, reports to be written, controversies to be settled, his organization to be kept on its toes, and a thousand and one decisions to be made—can all be lessened through use of sound standards. Standardized products, standardized specifications for materials, standard processes, standard operating routines—all help to relieve this pressure on executives up and down the line, from foreman to president.

This is accomplished chiefly by cutting down the number of decisions that have to be made through the reduction of innumerable problems to operating routine. Every one of these types of standards cuts down on the number of conferences that it is necessary to hold, on the number of misfires, on controversies in the operation of the plant, and on controversies with customers. In most cases this is brought about by solving

problems in advance so that they never come before the executive for his consideration.

My firm manufactures pipe fittings and valves. We stock something like 44,000 finished items. We sell to many industries and have not only a nation-wide market but an international market as well. Our manufacture is decentralized in that our plants are widely scattered geographically. Under these circumstances, our company has made extensive use of standards. Perhaps our long experience with standardization as a managerial tool may be of some use to other companies.

Interchangeability First Problem

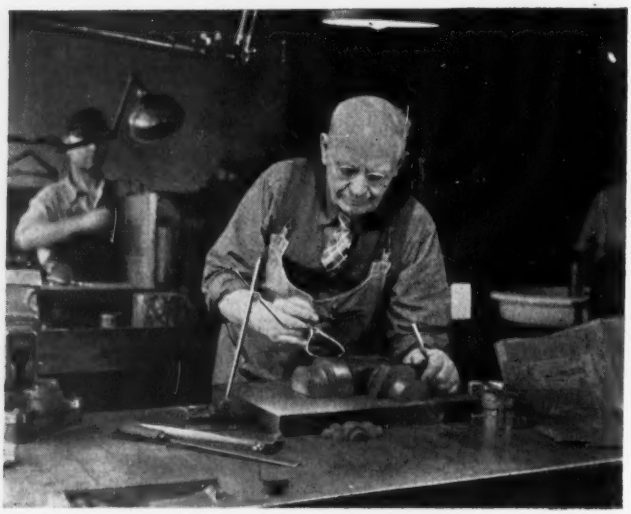
The first problem that had to be solved before we could have a real national market was interchangeability in the pipe threaded products. This problem was so acute that more than 30 years ago the different manufacturers in our industry cooperated in setting up a committee to deal with this question of interchangeability and related problems. Though the Brigg's standard for pipe threads was proposed in 1886, a vast amount of work had to be done before thorough interchangeability in the joints of pipe threaded products became an accomplished fact in 1915.

Rapid development in those industries in which we find our most important customers (the railroads, power plants, and petroleum industries, for instance), the problems brought about by the war, and the rapid expansion and development of industry in the '20s, so increased the importance of standards that in 1924 this committee of the industry was expanded into a trade association, the Manufacturers Standardization Society of the Valve and Fittings Industry, whose sole purpose is standardization.

At one stage our industry was faced with a very difficult situation in that various purchase specifications which we had to meet differed among themselves in the thickness of metal required in the different parts of valves and fittings. The cost of tooling up for the production of a series of valves or fittings, in preparing jigs, patterns, and means of production control, was so great as to make it prohibitive to produce a special series for each purchase specification. At first this situation was met by using the maximum thickness specified in any one of the groups of purchase specifications for each part of the valve or fitting. This, of course, resulted in a wasteful design, uneconomic to the user as well as the manufacturer, since it involved waste of metal and unnecessarily heavy finishing costs. Yet it was less expensive than it would have been to bring out a line for each purchase specification.

A similar situation existed in the specifications for the metals out of which the valves and fittings are made, and also in connection with the terminology used and the marking of the valves and fittings. With the advances in the art the metals used now include several standard grades of brass and bronze, other non-ferrous alloys, and various alloy steels. With different specifications for the metals used in each type of valve and fittings, the number of mixes we had to use was greatly increased, with corresponding increase in cost of production. All this added to the cost of selling, and frequently caused dissatisfaction among customers.

Most valuable assistance was given in these



Standards help pipe and fittings manufacturers to reduce costly variety in patterns required to meet customers' demands.

This composite view of the Walworth factories shows how widely scattered are the manufacturing activities of the company. Standardization makes possible the use of these factory facilities interchangeably.

dimensional and metallurgical problems by the American Society of Mechanical Engineers, the Heating and Piping Contractors National Association, and the American Society for Testing Materials. All of these complications, however, called for truly national standards acceptable to consumers, distributors, and manufacturers alike, especially in view of the fact that a truly national market was involved.

Fortunately, there became available in this juncture the services of the American Standards Association, the national standardizing body, whose primary job is to meet this precise type of situation. Its machinery, tested by years of experience, is designed to bring about the development of new standards or the unification of existing standards into a set of consistent national standards acceptable to all the groups concerned.

It was fortunate for our industry that it brought all such major problems into the American Standards Association as early as it did. It was just in time to meet what would otherwise have been an extraordinarily difficult and expensive situation. It happened that in two of our principal consuming groups, power plants and petroleum refineries, we were faced with the necessity of developing valves and fittings for both temperatures and pressures very much higher than had ever been used in any industry previously. Had it not been for the Standards Association it seems extremely likely that the industry might easily have been faced with a medley of specifications not only in each of the consuming industries but in each of the companies in each of the industries. As it was, the machinery of the Standards Association was used by all of the industries concerned to unify their requirements into a single coordinated system of sizes for these high temperatures and pressures, up to 2500 lb per sq in. This was possible only through the whole-hearted cooperation of our consumer industries. In these higher ranges the American Standards for flanges and fittings are used in practically 100 per cent of the production throughout the country. This alone has saved my company hundreds of thousands of dollars, and I believe I am safe in saying that this is true of other companies in the industry.

In many ways, American Standards have been of value in our customer relations. For example, in accordance with these standards the entire industry now marks its product in a systematic way with the data necessary to show its specific use in installations, such as pressure rating and an indication of the standard with which it complies.

Important advantages have accrued from collateral standards. For example, when the $4\frac{1}{2}$, 7, 9, 11, 15, and 22 inch sizes were dropped from the American Standard pipe sizes, it enabled our industry to eliminate hundreds of items from the inventories which it has to carry.

I fear that most people think of standards as affecting design and production only, but it has been my experience that they bring about economies in most of the operations of a company.

This is especially true from the sales angle. For example, since the consumer groups are officially represented in the development, unification, or revision of the American Standards which involve our product, the work automatically carries with it a large degree of acceptance of products which comply with these standards. Orders for material complying with the standard automatically start coming in as soon as a new standard is announced.

Our ability through standardization to show engineering information in our catalog has been a great help, too. Our selling job is simplified when we can show in our catalog that a product complies with a standard which has been agreed upon between manufacturer and user. Our customers are able to find exactly what they are looking for and avoid delays which would be unavoidable if it were necessary to get the information through a salesman. Through their cooperation in helping to unify these standards our customers are better acquainted with our problems and we with theirs, another result of our standardization program which helps us in our customer relations. The ability to make frequent reference to American Standards and to other well-known standards throughout our catalog and in our trade literature is the equivalent of considerable additional sums which would otherwise have to be spent in advertising.

Difficult problems encountered in taking over an existing plant and integrating it into a company set-up I have found to be greatly simplified by the fact that most of our products are standardized. We have found it advantageous at times to make a full line of fittings at one plant and a partial line at another and interchange them. When one plant is busy we can ship material from another plant because it is standard. Standardization has helped greatly to make it possible to integrate the system into a smooth-working whole.

Under our plan of organization, standardization activities head up to the Vice-President in Charge of Engineering, who in turn reports directly to the President. Engineering and production functions are rated as of equal importance.

The advantages which my company has reaped from the extensive use that we have made of standardization could, I believe, be summed up in the phrase "reducing things to simple routine." It has cut down the pressure on executives from top to bottom of our company, releasing them from the necessity of making many minor decisions. In fact, standardization is a major key to administration. When a company has introduced a well-rounded program of sound standards for office, purchasing, and operating routine as well as for engineering and shop practices, that company is well along toward an effective organization.

Gaging an elbow for accuracy of thread

Gages are checked frequently to insure their remaining within the tolerances approved by the American Standards Association.

Leading Executives Form ASA Advisory Committee

by

Edmund A. Prentis

President, American Standards Association

Great industries represented on committee use standardization as essential factor in operation

Membership also shows interest of engineering education, finance, and merchandising organizations

THE American Standards Association is fortunate in being able to announce the organization of an Advisory Committee of 13 of the leading executives of the country.

It is no accident that the committee includes men from so many of our great industries. Standardization has been an important factor in their growth—in the development of electricity, power, the telephone, railroads, and the automobile.

It is no accident that ranking executives are lending their influence and giving of their time to a program of national standardization. As Howard Coonley, chairman of the committee, points out elsewhere in this magazine, standardi-

ASA Advisory Committee

Executives of industry, education, and finance, now members of the Advisory Committee of the American Standards Association, are:

Howard Coonley, chairman of board, Walworth Company, *Chairman*

Ralph Budd, president, Burlington Lines

Floyd L. Carlisle, chairman of board, Consolidated Edison Company of New York

Dr. Karl T. Compton, president, Massachusetts Institute of Technology

Lammot du Pont, president, E. I. du Pont de Nemours & Company

Lincoln Filene, president, Wm. Filene's Sons Company

Walter S. Gifford, president, American Telephone & Telegraph Company

Leroy A. Lincoln, president, Metropolitan Life Insurance Company

J. H. McGraw, Jr., president, McGraw-Hill Publishing Company

A. W. Robertson, chairman of board, Westinghouse Electric & Manufacturing Company

Alfred P. Sloan, Jr., chairman of board, General Motors Company

E. R. Stettinius, Jr., chairman of board, U. S. Steel Corporation

Walter C. Teagle, chairman of board, Standard Oil Company of New Jersey

Howard Coonley, Chairman

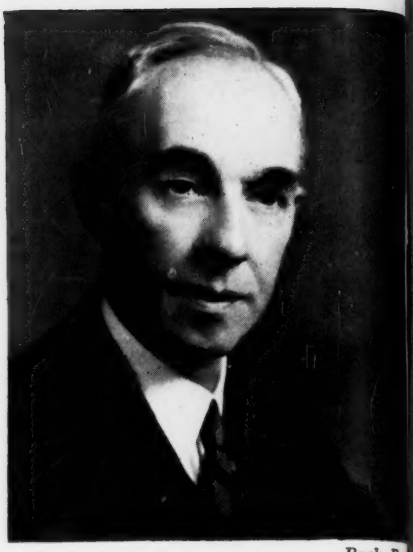
Alfred P. Sloan, Jr.

zation is one of the most effective tools available to executives in the development of the business of a company.

Neither is it an accident that Mr. Coonley is chairman of the committee. He has had as wide experience with standardization as any man in this country. His own company is using standards effectively in design, production, sales —even in the integration of different plants into a smooth-working organization. The trade association of his industry, of which he has been president ever since its organization, exists for the sole purpose of standardization. For years he has been active in the national standardization program, acting as president of the American Standards Association through some of the most difficult years of its history. Now, as president of the National Association of Manufacturers, Mr. Coonley himself symbolizes the executive's increasing realization of the importance of standardization to management.

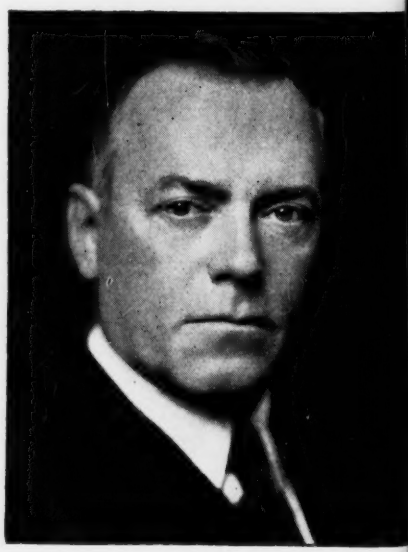
While the trend is that more and more executives are giving attention to standardization, it is only a decided minority of companies, even of the larger ones, that have yet made it an important managerial function. In a way, the history of the American Standards Association symbolizes the increasing interest and influence of the executive in standardization. In most industries the trail was blazed by the engineer. In fact the ASA was organized by five of the great engineering societies. They soon found, however, that it was necessary to bring in trade associations and the Government on the same basis as the technical societies. During the first ten years of its existence this organization was known as the American Engineering Standards

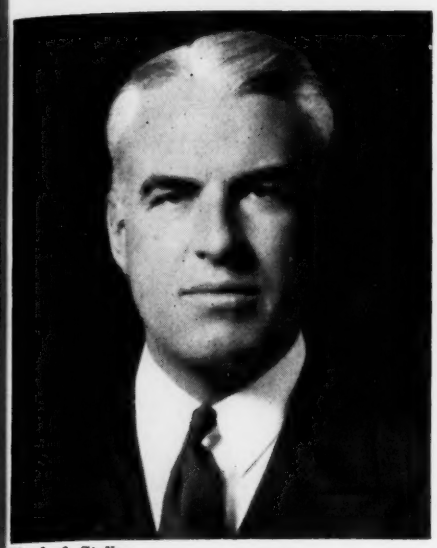
Left: Dr. Karl T. Compton
Right: Walter C. Teagle



Leroy A. Lincoln

Ralph Budd





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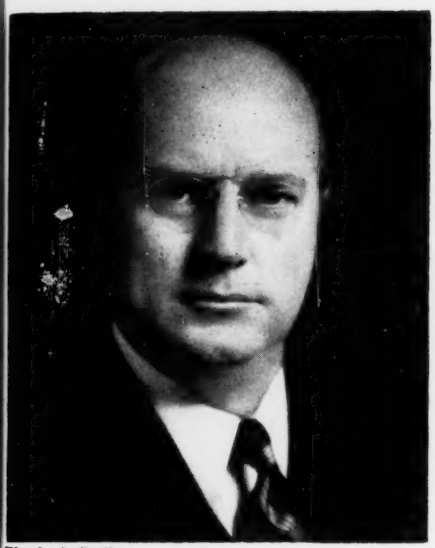
E. R. Stettinius, Jr.



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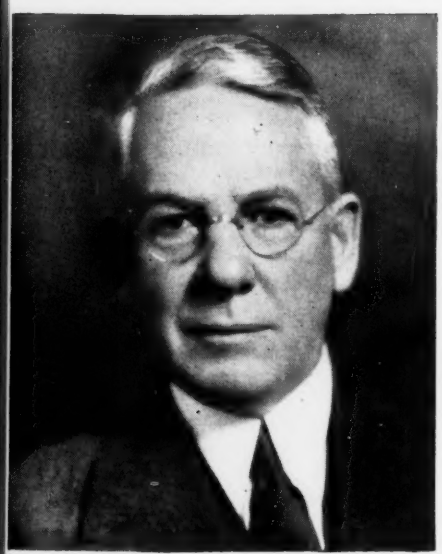
J. H. McGraw, Jr.



Blank & Stoller

Committee. As the work grew the need for executive support and direction became more imperative and the committee was reorganized in its present form, responsibility for its policies centering in a Board of Directors of industrial executives.

With the cooperation of management, the work of the ASA has broadened rapidly into new fields which present problems to management as well as to engineers—problems of safety, prevention of occupational diseases, building codes, traffic regulations, and now, standards for consumer goods. These last bring new managerial and merchandising problems.

The Advisory Committee is the final step in this progressive movement, bringing as it does first-line executives into the national standardization program as the final source of advice on major problems.

What lies ahead? Perhaps the relatively recent, but widespread and effective use of research as a managerial tool may point the way to the future of standardization. As Albert W. Whitney has said, "Research is the making of advances; standardization is the consolidation of the gains."

Standardization, to do its part effectively in consolidating these gains of research, must be more flexible; its pace must be increasingly rapid; there must be an ever more widespread recognition of its role as an important function of management.

It is encouraging that this recognition of standardization by management is actually taking place. The very personnel of this Advisory Committee of the ASA gives proof that first-line executives of American industry are now accepting standardization as one of the prime functions of management.

Left: A. W. Robertson
Right: Lincoln Filene

Blank & Stoller

Floyd L. Carlisle

Wide World

Walter S. Gifford

The American Standards Association

A Place to Go

RECENTLY a New England marble manufacturer was faced with the problem of controlling the quality of surface finish in the work of a group of sub-contractors on a big job. Such control was needed to prevent inequalities in the finish produced by the different contractors from marring the appearance of the completed work.

What to do? He wrote the American Standards Association asking whether some method could not be developed to measure the quality of marble surfaces. He found that manufacturers in several other fields had encountered the same problem, in fact that the Association already had a committee of experts from these industries at work developing standards for surface qualities.

The manufacturer has a toe hold on his problem. He found a place to go.

Five years ago the American manufacturers of small movie cameras found themselves up against a fast moving situation in Europe which was headed straight toward international agreement on a standard which would compel them to modify their cameras and projection equipment or be hampered in their foreign market. They came to the American Standards Association. That very day a cablegram went from the ASA to the International Standards Association. Eighteen months later unanimous agreement was reached throughout the world on American practice as an international standard for 16-millimeter sound film and equipment.

In each of these cases a ready-to-serve mechanism was at hand which industry itself had set up to solve these very problems—the American Standards Association.

What It Is

This mechanism is the nation's clearing-house for standards. It has been built up through twenty years of experience through continuous cooperation between industry and government. It is available to industry and to government in solving technical problems—problems of the interchangeability of machine parts; of specifications to assure the suitability of products; of developing adequate methods of test; of standard safety provisions for machinery and processes; of standard nomenclature to assure that buyer and seller shall speak the same language.

The American Standards Association is a federation of national groups. The American Petroleum Institute, the Association of American Railroads, the American Society for Testing Materials, the American Society of Mechanical Engineers, and the Federal Departments of Commerce, War, and Navy, are some of the 73 national trade associations, technical societies, and government departments that make up the primary membership. There are also some 2,000 company members.

Most of these national groups and companies are already carrying on standardization activities as a part of their own programs. They utilize the American Standards Association as a clearing-house for their activities thus making possible the development of Standards on an inter-group basis.

The Association is democratically controlled by its membership. Finances and general policy matters are in the hands of a Board of Directors made up of 19 executives each nominated by a different industry. The technical work is supervised by the Standards Council which is composed of representatives of all the Member Bodies.

How It Works

The major job of the American Standards Association is to provide the means for arriving at national industrial standards.

The Association undertakes work only upon request of a responsible organization or group. It then provides the machinery through which this and other groups concerned can themselves arrive at a decision.

ASA methods of work are based on the fundamental principle that all groups affected by a standard have an inherent right to take part in its development. Standards and revisions of standards may come before the Association for

approval by any of several methods that clearly provide compliance with this principle.

While, under the most commonly used method, standards are developed by representative committees, existing standards may also become American Standards if support by the industries concerned can be clearly shown. Or a relatively simple standard may be developed through a conference of the interested groups. These latter methods have been provided for flexibility and convenience.

By frequent review and revision American Standards are kept abreast of new developments in the fields to which they relate.

Membership

Membership in the American Standards Association is open to associations, companies, or individuals interested in the work.

ASSOCIATIONS—National associations may join as Member-Bodies, subject to approval by the Board of Directors. It is with this group of members that ultimate responsibility for the policies and affairs of the Association rests. This authority is carried out through representation on the Board of Directors and on the Standards Council. Dues for this class of membership amount to $500 for each representative on the Standards Council, with a constitutional limit of three.

Associations not in a position to assume the financial responsibility of full membership may become Associate Members. This class of membership does not include representation on the Board of Directors or the Standards Council. Dues for Associate Members are from $100 to $500 a year.

COMPANIES—Corporations having an interest in standards may join as Company Members. Dues for this class of membership are based on one cent per thousand dollars of total annual business, with a $50 minimum, except in the case of very small companies.

A combined association and company membership is also available for the convenience of trade associations wishing to make ASA services directly available to their member companies. ***The American Iron & Steel Institute, the Edison Electric Institute, and the Association of American Railroads*** are among the Associations that have provided their own company members with direct company memberships in the ASA. This has proved the most effective and economical way for companies to join the American Standards Association.

INDIVIDUALS—Consulting engineers, professors, students, and other interested individuals without company affiliations may join as Individual Members upon payment of dues of $10 per year.

Services to Members

The fundamental service of the American Standards Association to industry and to companies is, first, the unifying and codifying of policies and practices into clear, simple standards which management can use. Second, it helps management in the technique of the effective use of standards as tools.

The ASA is thus the agency primarily responsible for bringing the economies of standardization on a national scale to the individual company.

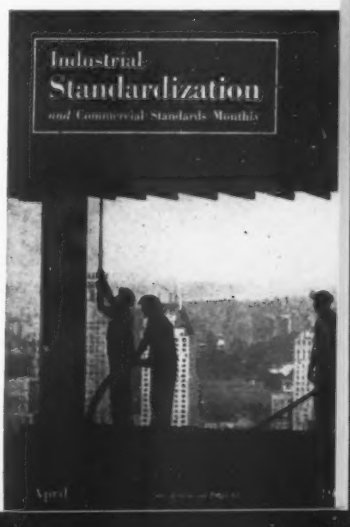
For all of its members the Association provides certain direct services.

It publishes a magazine, INDUSTRIAL STANDARDIZATION, which every month brings to the engineers and executives of member companies news of standardization activities in this country and abroad, and frequent articles on the practical application of standards in industry.

It provides an INFORMATION SERVICE AND REFERENCE LIBRARY for the use of members. The library contains 20,000 standards, books, and related documents, including a file of the national standards and purchase specifications of other countries. This library is the only place in the country where some of this information can be found.

The Association provides members with free copies of newly approved standards in which they are interested and with a 20 per cent discount on additional standards.

Through its technical staff, through its library, through the pages of its magazine, through free copies of standards, and through correspondence, the American Standards Association keeps members in touch with existing standards that affect their business interests. It also keeps them in touch with new developments in standardization in this country and abroad. When desired, it provides the means of participation in international undertakings of interest to its members.



A service to members. Each month this magazine brings news and information about the use of standards in industry.

Electrical Standards

THE rapid and successful growth of the electrical industry may be attributed in no small part to successful use of the standards which its technical societies and trade associations have been developing since the very early days. It is no accident that today you can buy any make of electric iron or radio and you can plug it in wherever you like, or that you can purchase incandescent lamps at the five and ten cent store. Nor is it any chance that electrical appliances are in general so safe to use. Technical requirements for the installation and use of electric wiring and apparatus have been in existence for more than forty years.

Standardization in the electrical field has cut down the lag between research and its practical application and through standard definitions and terminology has provided a common language for electrical machinery and apparatus.

The electrical industry has been very active in ASA work since the Association was founded in 1918 to serve as clearing-house for the development of industrial standards. In fact the American Institute of Electrical Engineers took the first step in setting up the Association; and its members have always occupied an important position in the policy-forming and technical councils of the Association.

There are today some sixty approved American Standards in the electrical field covering, for example, wires and cables, transformers, insulators, batteries, switchgear, motors, generators. Some of these standards have come into the ASA as the existing standards of other organizations. For instance, the American Society for Testing Materials and the American Institute of Electrical Engineers have submitted many of their standards for approval to the American Standards Association. Through such approval, these standards, already in wide use, have gained even greater acceptance. Many other important standards in the electrical field have been developed under the regular committees of the American Standard Association.

By utilizing the ASA the electrical industry has been able to bring about uniformity in the provisions of its standards. For instance, the American Standards for Rotating Electrical Machinery, approved in 1936, harmonized and further developed all the important rating standards in this field—standards of both the National Electrical Manufacturers Association and the American Institute of Electrical Engineers.

Participation in ASA work has also given the industry a voice in the development of many standards for materials and mechanical parts which it could never have developed itself but which are of importance to both manufacturers and power companies.

The National Electrical Code, first formulated by the fire protection groups, has been under the procedure of the American Standards Association for 20 years. It is now so widely used as to be called the bible of the industry. Several thousand communities throughout the United States have adopted the Code as the basis of their regulations for the installation of electric wiring. The laws and ordinances of these communities are so

International Work in the Electrical Field

Cooperation in international work is facilitating foreign trade in electrical machinery and apparatus. This work enables purchasers to compare offers to supply apparatus on a uniform basis regardless of the country from which the bids are received. Much work has also been done on the fundamental subject of electrical units, on standardization of letter and graphical symbols, and in the preparation of an international electrotechnical vocabulary. This work is being carried on through the International Electrotechnical Commission and its U. S. National Committee which operates under the American Standards Association.

The American electrical industry is cooperating internationally on 26 projects having to do with electrical equipment, machinery, terminology, or other matters of importance to it. Completed work includes international standards for transformers, for heavy rotating electrical machinery, measuring instruments, definitions of electrical terms and units, and a series of dimensional specifications for lamp bases and sockets.

The American Standard Code for Protection against Lightning (C5) is widely used in industry.

Courtesy General Electric Company

worded that as each new edition of the code is approved by the American Standards Association it automatically replaces the older edition, enabling the community to derive the greatest economy and protection from new materials and processes.

Another code, the National Electrical Safety Code, provides rules for the safe operation of electrical lines and equipment. After nearly a decade of controversy among the interested groups this code was brought into the American Standards Association and through the methods of the ASA unanimous agreement was reached within a year.

Responsible executives have said that each of these two codes has saved power companies and manufacturers more than a million dollars a year, that the work is helping the electrical manufacturing industry to maintain its markets, free of restrictive local ordinances and petty political racketeering.

Eighteen American Standards for the more important types of insulated wire and cable affects a portion of the electrical industry amounting to $200,000,000 a year. This work on wires and cables was started at the request of the manufacturers who found themselves in a position of distinct disadvantage in foreign trade, because of lack of nationally recognized specifications. At least a dozen organizations had issued standards and there had been literally thousands of private specifications to which the manufacturers were expected to supply material. The more important of these, through the procedure of the ASA, are now being welded into a consistent set of national standards having the approval of all the groups.

Standards for railway motors, for watthour meters, for insulators, and for wood poles are further examples of the electrical industry's use of the American Standards Association. Some of the many important projects now under way include Standards and Specifications for Transformers, Guides for the Operation of Transformers by Temperature, Specifications for Oil Circuit Breakers and other types of switchgear, and a compilation of definitions of more than six thousand terms used in the electrical field.

Mechanical Standards

NEARLY a fourth of the American Standards approved to date are in the mechanical field. These include standards for the parts that go into manufactured products, standards for the tools used in production, standard fits, standard gaging methods. Groups of these standards in several fields are essential factors in the rate of production per man-hour that has given the United States leadership in mass production methods. So many groups and organizations have joined in doing this work through the American Standards Association that these mechanical standards have become part and parcel of industry.

In the early days the proper dimensions of machine parts, pipe fittings and valves, thicknesses of tubes and pipe, etc., were largely a matter of personal opinion. It is only thirty years since the first automobile was successfully assembled from stock parts. That is hard to remember when we see the rate at which automobiles come off the assembly line today, the individual engine parts fitting together with an accuracy that was unthinkable thirty years ago. Today a company can manufacture bolts and nuts at the rate of 10 million per day, in five plants scattered across the country, with complete interchangeability in the product—simply because all threads are made to an American Standard.

Some of the standardization problems whose solution has made such rates of production possible were already under consideration when the American Standards Association came into being in 1918. But the very number of corporations, trade associations, and technical societies working on these problems, resulted in additional confusion rather than in clarifying the situation. With

Courtesy Pratt and Whitney Company

Standard gages control the quality of countless products

the organization of the American Standards Association to provide a forum where all groups could present their needs and pool their experience and knowledge, much of this work was put on a national basis.

Industry's need for a common engineering language resulted in the development of an American Standard for Drawing and Drafting Room Practice and another for Graphical Symbols.

Interchangeability of parts is a problem of basic importance in which standardization on a national scale has played an essential part. Standard manufacturing limits and uniformity in gaging practice have helped to make possible both the wholesale production of machinery and modern decentralization of plant operation. The automobile industry estimates that standardization of parts is saving eight hundred million dollars a year.

Nine American Standards for bolts, nuts, and rivets provide for complete interchangeability and for a definite system of thread fits. One of these, the standard for wrench head bolts and nuts and wrench openings, has unified industrial practices in nearly all the major fields of application. The American Standard for Screw Threads (Coarse and Fine) has brought about national uniformity of threaded parts for different kinds of screws and for the nuts or the tapped holes matching them. Parts made to such standards can be readily purchased from the shelves of the manufacturers, at lower prices than non-standard items. A firm that had been paying $70 a hundred for one-inch cap screws before the American Standard was developed, got the same product for $9 a hundred afterwards.

These same advantages apply to many other widely used parts for which American Standards have been developed, among them ball bearings, shafting keys, pipe flanges and fittings, and roller chains. They also apply to component parts of many of the machine tools used by the industry, and to materials purchased by a company for the manufacture of parts in its own shop.

American Standards, by eliminating odd sizes and unusual specifications, have enabled the mechanical industries to cut production costs and to make savings in purchasing. Some years ago when the ASA committee on Machine Tapers started its work, a survey showed that close to two hundred different tapers were being used in machine tool parts. Now, the American Standard covers the requirements with only 19 tapers.

The importance of having a national clearinghouse for standardization work in cases such as this is obvious. Without one, each user group must set up its own specifications for the products it buys. Every additional set of specifications means an extra load on the manufacturer, which is reflected in higher prices for the finished product, and a lesser degree of interchangeability.

This standardization work cannot stop at home. Inevitably it becomes a problem of the manufacturers and suppliers in all the countries with which American firms do business. This has led to some important international work, for example on ball bearings and fits for machine parts. This work is of use to our import and export trade. Through the membership of the ASA in the International Standards Association, the mechanical industries have for some years had opportunity to take part in all international work of interest to them. Furthermore, the ASA maintains a file of the standards and specifications of other countries, which are readily available to American manufacturers.

American Standards for industrial safety and for protection from occupational disease hazards are also of vital interest to the mechanical industries. Such American Standard Safety Codes as the one for abrasive wheels are helping manufacturers to safeguard workmen and to cut their accident costs. The high esteem in which these codes are held by governmental groups has done much to unify state and federal regulations, and the methods by which these codes are developed has given industry a chance to make its experience count in the regulations under which it must operate.

The mechanical industries are continuing to utilize the American Standards Association in such unfinished work as that on surface finishes; speeds of machinery; and sizes, shapes and lengths of iron and steel bars. The work on surface finishes is particularly important in producing the close fits so often required nowadays, and in measuring the quality of finishes obtained by different processes. For example, comparing the "mirror finish" of one firm with the "super finish" of another, will become possible only through the establishment of a standard basis of measurement.

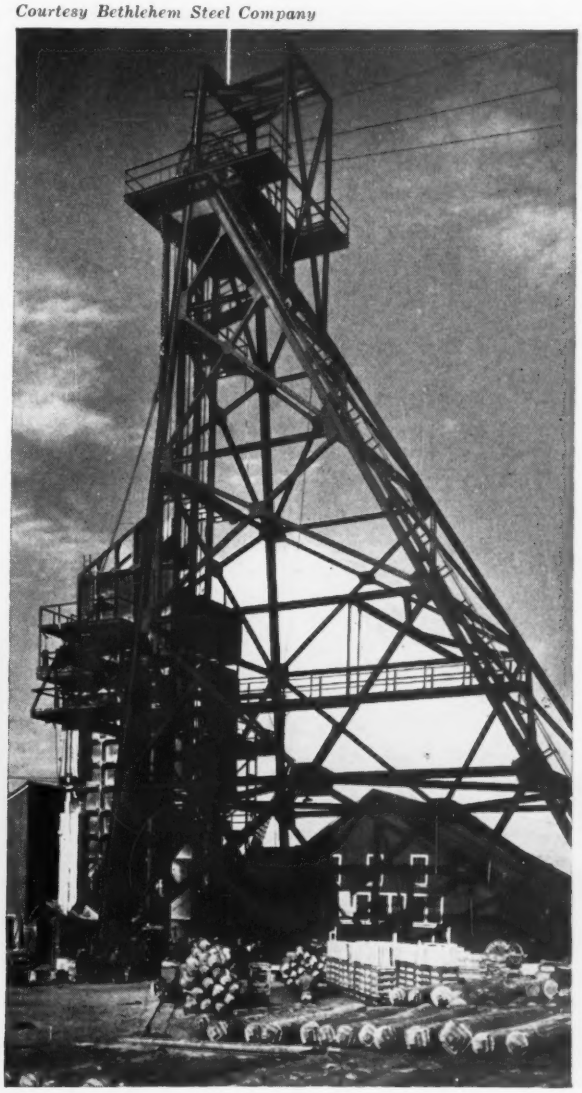
Mining Standards

THE mining industries and their employees are served by 18 American Standards in the mining field. These include safety codes for the use of explosives in coal mines, for illumination, for the proper construction of ladders and stairs, for underground transportation, etc. They also include a number of standards that deal with mining equipment. The development of standard gages for coal mine tracks, for example, has been of great economic importance to the mining industry as have the American Standards for tracks and frogs and switches and turnouts. The American Standard for Wire Rope in Mines is used extensively, not only in mining but in other industries as well.

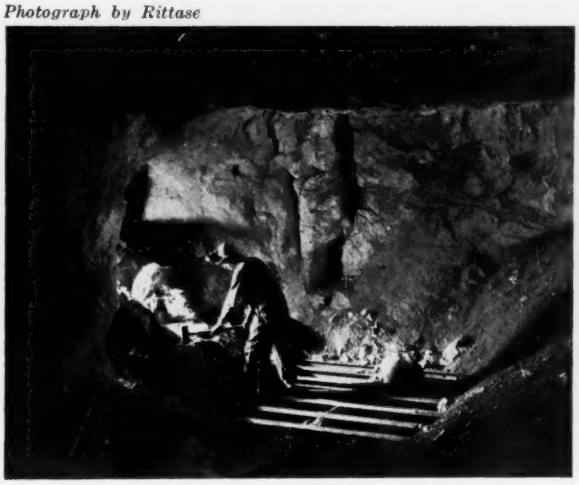
The American Standard for Rock Dusting Coal Mines has been an important factor in mining safety. Its use has saved scores if not hundreds of lives. In one large mine in the Pittsburgh area, for instance, an explosion in a section of the mine not yet dusted cost the lives of many men, while workers in the other section went unharmed. State regulations upon the subject of rock dusting are today based upon this code.

An important group of American Standards for the classification of coals has recently been completed. These standards provide a common language for classifying coals by rank and by grade, and are consequently of value to coal users as well as to the mining industry. They are the culmination of ten years' work by a broadly representative committee of American technical and industrial groups. It has been estimated that the Department of Mines in Canada, the U. S. Geological Survey, the U. S. Bureau of Mines, and others cooperating in the work have spent over $100,000 on field and laboratory study of problems connected with this classification of coals.

Courtesy Bethlehem Steel Company



Photograph by Rittase



Consumer Goods

THERE is a widespread and rapidly growing "consumer movement" in this country, which is based upon a feeling on the part of consumers generally that they are needlessly hampered in the selection of the goods they want and can afford. Their chief cry is for standards for the goods they buy—standards that will define the characteristics of these goods in terms they can understand and that will consequently help them to conserve the purchasing power of their incomes. Our grandmothers were not faced with the problem of washability of rayons or the purchase of electric refrigerators. However, the bewildering array of new fabrics, packaged foods, and mechanical household helps of today, have dislocated the buying methods of 50 years ago, consumers feel.

As a result of early standardization work, part of which was initiated by the American Home Economics Association and the U. S. Bureau of Home Economics, there are today a number of American Standards for retail goods. These include standards for testing ice refrigerators; standards for methods of testing woven textile fabrics; specifications for dry batteries; specifications for labeling cotton yard goods; and standards covering installation and performance requirements for all the commonly used gas-burning appliances.

In 1936 the increasing demand for the work on the part of women's groups led the Association to organize a committee on consumer goods, bringing together for the first time representatives of the great national consumer and retailer organizations for a systematic study of standards in retail trade. This Committee now keeps a guiding hand on all standardization projects in the consumer field, and represents the consumer point of view in other ASA work.

This committee today includes five national consumers' organizations whose combined membership runs well into the millions—***the American Association of University Women, the American Home Economics Association, the General Federation of Women's Clubs, and the National League of Women Voters.*** Retailers are represented on the committee through the National Retail Dry Goods Association. The Federal Government is participating through five of its bureaus.

The Association is now engaged on a number of jobs that go deeply into the problem of consumer-retailer-producer relations, and that have to do with standards for the durability and serviceability of goods sold at retail. This program does not touch the style element.

A committee is working on standards for bedding and upholstery, including methods of test. The committee proposes defining new and reworked filling material, and developing sanitary provisions for sterilization and for labeling. The aim is to give the consumer better protection and at the same time to promote uniformity in the bedding requirements of those states that have already enacted legislation and in others where attention is being given to proposed statutes.

Another committee is at work developing American Standard body measurements to be used as the basis of a workable system of sizes for children's garments. The present confusing method of sizing by age is causing consumers great inconvenience and costing retailers several million dollars a year in the return of clothing that does not fit. The standards will be based on a survey of the actual body measurements of 147,000 children between the ages of four and seventeen. This survey has recently been completed by the U. S. Bureau of Home Economics.

Other committees are investigating the need for work in such fields as shoes, sheets and sheeting, boys' clothing, hosiery, household refrigerators, silver plated tableware, water proof and water repellent fabrics, and color permanence.

Why Standardize?

The practical value of such standards to manufacturer, retailer, and consumer alike has been demonstrated by the success of the American Standards for gas burning appliances. This work has been an important factor in the improvement of many lines of gas appliances and has led to an increase in sales all along the line.

Another striking example of the practical value of consumer standards is that of the IES lamp. The manufacturers of this lamp which is made and sold entirely in accordance with technical specifications were unable for months to keep up with orders.

Sound standards in the merchandise field have thus proved their value in helping to channel the goods from the manufacturer to retailer to consumer. Such standards constitute a common language for these three groups. They enable the retailer to state with surety whether a garment will shrink when cleaned, a gas oven will bake uniformly, or whether a lamp will light one's book without glare. Such standards cut down the volume of returned goods by providing more accurate information at the point of sale.

Building Codes

Courtesy Bethlehem Steel Company

AMERICAN Standards have been widely used in the building regulations of states and municipalities, particularly such standards as the Safety Code for Elevators, the National Electrical Code, and the Fire Tests of Building Construction and Material.

When the Department of Commerce discontinued its work on building and plumbing codes in 1934, it requested the American Standards Association to continue the undertaking. This is being done in close cooperation with the National Bureau of Standards which is carrying on important research work in both fields. There is a great need for coordinating building code work on a national scale, both to eliminate uneconomic diversity in building regulations and to provide greater flexibility for the introduction of new methods and materials.

Significance of this work may be judged by the magnitude of the housing problem in this country today and by the fact that there are some 1500 separate building codes at present in effect. The majority of these are municipal codes; but to complete the picture one must add county and state codes. Naturally the job of keeping all this building legislation up to date is a serious one. Not only are many of these codes closing the door to the development of new materials and new methods, but through obsolescence they are blocking the use of good construction methods already available. Furthermore, the tendency on the part of special interest groups to influence the provisions of local codes has led trade associations representing competitive industries in the building field to maintain expensive staffs for the purpose of furthering the interest of their members in proposed building legislation.

The building code committee of the American Standards Association today includes representatives of 22 national organizations in the building field. The city governments as such are cooperating through the American Municipal Association; building officials through their organizations. The principal Federal agencies dealing with housing problems, the architects, and the civil engineers are among other groups taking active part in this work.

Technical committees operating under the supervision of the building code committee are developing requirements for such fundamental building code subjects as Loads, Working Stresses, Fire Resistance, Light and Ventilation, and Foundations. Other technical committees are working on requirements for masonry, wood, gypsum, and iron and steel work.

In this way a comprehensive group of standards are being developed, covering the entire field of the average building code. These standards will be drawn upon for the chapters of a model American building code. Both standards and the model code will serve as a guide for the revision or development of local building regulations.

The committees at work on these standards are placing greater emphasis on performance as a basis for requirements than has been done in previous model code work. This leaves the designer and builder all possible freedom in the choice of materials and methods; and is expected to encourage the development of new materials and processes that will lead to more economical housing.

The Building Code Committee has, for convenience, divided the work which it is developing into sections. Section 1 covers Administration; 2, Definitions; 3, General Building Restrictions; 4, Special Occupancy Requirements; 5, Light and Ventilation; 6, Means of Egress; 7, Loads; 8, Construction Requirements; 9, Fire Protection and Fire Resistance; 10, Chimneys and Heating Appliances; 11, Fire Extinguishing Equipment; 12, Precautions During Building Operations; 13, Signs and Billboards; 14, Electrical; 15, Elevators; 16, Plumbing.

urtesy Norton Company, Worcester, Mass.

American Standard Safety Codes designate guards for machinery

Safety Codes

NATIONAL safety codes developed by industry through the American Standards Association have played an important part in the reduction of accident rates and in the frequency and severity of industrial accidents.

Loss of human life in the mills and factories of the early nineteen hundreds led to a public demand for reform. Compensation brought the problem of safety sharply to the attention of industrial management, and at about the same time the states began enforcing safety regulations. The next half dozen years saw enactment of a huge mass of conflicting laws, until an electric motor in order to be legally safe in the state of Pennsylvania, actually had to be legally unsafe in the state of Wisconsin. Matters were further involved by the multiplicity of safety regulations on which the various insurance companies based their rates. What industry needed was one simple set of national standards which would be satisfactory to all groups involved and which could serve as a basis for both state regulations and insurance schedules.

In 1919 at the request of the National Safety Council the National Bureau of Standards called a safety conference. A second conference held eleven months later recommended that a program of national standards in the field of safety be inaugurated and that the American Standards Association, which had only a short time before been organized to serve as clearing house for industry's technical problems, be asked to head up this other work as well.

Since that time more than sixty American Standard Safety Codes have been completed and there are many more in the course of development. They specify good lighting conditions for factories, and designate guards for machinery that will prevent the careless operator from mangling a finger or an arm. They specify safe methods for construction work, for mining coal, for forging and stamping hot metals, for protecting workers in foundries. There are national safety codes for window cleaning, for protection of the heads and eyes of industrial workers, for mechanical refrigeration.

These codes today form the backbone of state industrial regulations. Insurance companies use them as a basis for advice to their assured. Meanwhile they provide industry itself with good common-sense rules for decreasing accidents. Manufacturers, employers, employees, state and federal regulatory bodies, insurance companies, and safety organizations are all pooling their experience and knowledge in the development of these codes, each group taking part in the work through representatives of its own choosing.

The appeal of these codes to all the groups concerned is naturally stronger than if the regulations were laid down from outside. The Federal government uses them in its own factories such as the navy yards and arsenals. In fact the government's safety work is pooled along with industry's in the development of these codes. As a consequence, some of these codes, such as the one covering use and care of grinding wheels, have virtually become the "bible" of the industry.

These codes constitute a unique example of industry-government cooperation. The work has helped to bridge the gap between state and federal governments.

The American Standards Association was asked to head up this work because both industry and government groups felt its organization to be peculiarly suitable for bringing together all of the groups interested in accident prevention without being dominated by any one of them. Actually the ASA has served as a clearing house in this work for industry, insurance, state and Federal governments.

This, in brief, is how the work is done: some responsible group makes formal request for a safety undertaking, pointing out, for example, the need of cutting down grinding wheel accidents, or for nationally recognized safety rules for elevators. The American Standards Association canvasses the industries involved to see whether the interest is general. Limits are set as to the ground the code shall cover; and frequently one or more groups that have already carried on research or done some standardization work in the particular field under discussion are asked to take administrative leadership in the work.

A committee to develop the safety rules is then organized. In the case of the Elevator Safety Code the committee included representatives of twelve manufacturers, two building management associations, ten governmental bodies, three insurance groups, and six independent specialists. For four years subcommittees worked intensively on different phases of the problem, while research financed by manufacturer and insurance groups was carried on at the National Bureau of Standards. The committee finished its work and the code was formally approved as an American Standard in April, 1925. The code has been revised twice since that date—in 1931 and again in 1937—to keep it in line with industrial advances. Some codes are revised more frequently; but in any case the national committee that developed the code usually continues in existence to clarify and interpret the provisions of the code and to prepare for possible revision. That is how the safety work is kept in line with the changing conditions in industry.

Industrial Health Codes

Silicosis and other industrial diseases present as tough a problem for industry today as mechanical safety did two decades ago. They threaten some 1,200,000 workers in many of our leading industries, according to an estimate by the U. S. Public Health Service. Here as in the safety code work the problem is complicated by the inadequacy of present technical information; by lack of uniformity in industrial practices, state laws and insurance regulations; and by questions of compensation.

National codes for the removal of occupational disease hazards are being developed through the American Standards Association in a manner similar to that used in the safety code program. Both industrial and governmental groups are sharing in the work. A national committee of doctors, industrial engineers, insurance and health experts, and governmental officials, is determining the limits beyond which the presence of specific gases becomes a disease hazard.

Their recommendations will help other committees in the work of developing standards for the technical requirements of exhaust equipment to carry off such dangerous concentrations of dusts, fumes, and gases. The first published report of the committee in charge of the technical work covers the basic features of design and operation of exhaust systems for industrial use.

Highway Traffic Standards

TRAFFIC standards have been one of the important factors in reversing the trend of accident frequency and severity in the past few years. This work has constituted a part of the ASA program for some time; but recent demands in the field have led to the organization of a new committee to coordinate the work. This committee for the first time brings together all national groups directly interested in standards in the motor, highway, or traffic fields. It represents a concerted effort on the part of eighteen national organizations to cut down the accident toll and

through standardization to bring some order out of the chaos of varying engineering practices and requirements.

Basic solutions of the fundamental problems of the traffic situation will also facilitate the movement of traffic and thereby increase the number of cars which the highways can accomodate.

The first national standard in the traffic field was the American Standard Colors for Traffic Signals, approved in 1926. This represents the joint efforts of car manufacturers, car owners, makers of traffic lights, the railroads, governments groups, etc., working through the American Standards Association to unify and simplify the color systems used for traffic control. Its wide acceptance soon caused the many systems and colors of lights in vogue in the traffic regulations of the time to disappear. As a result, today the motorist can tour the length and breadth of the country stopping on the red light, starting on the green. The standard is even being widely adopted in Europe.

In 1935, the work on traffic signs and signals of the State Highway Officials and the National Conference on Street and Highway Safety came into extensive use following its approval by the American Standards Association. This standard goes to the roots of good traffic habits and consequently has been a potent force in accident prevention.

Other standards have followed. A national standard covering railroad highway grade crossing protection, developed by the Association of American Railroads, was approved as an American Standard in 1937.

Again, as the use of safety glass in the windshields and windows of motor vehicles increased, representatives of automobile companies, glass manufacturers, state administrators, insurance companies, and safety experts met together under the auspices of the American Standards Association to work out a series of standard tests and requirements for safety glass. This in two and a half years has been adopted by 24 of the 37 states requiring use of safety glass in motor vehicles.

Courtesy General Electric Company

The open road creates many technical problems

Tests for Road-worthiness

Every year more states and cities require periodic inspection of motor vehicles, without there being any recognized national standards available as a basis for these inspections. Now, under the administrative leadership of the American Association of Motor Vehicle Administrators and the National Conservation Bureau a national committee is developing standards for inspection of brakes, lights, steering apparatus, tires, wheel alignment, accessories, etc.—in short, for the road worthiness of the car. This committee includes representatives of car manufacturers, car operators, motor vehicle administrators, state highway officials, insurance companies, and the general public.

Requests have been coming to the American Standards Association for further work in this field. National standards for highway lighting; specifications for highway guard rails; special barriers for drawbridges and railroad crossings; and uniform driver qualifications and tests are among the proposals received. All in some way relate to the safety and efficiency of the car, the road, or the driver.

National standards for traffic control are developed in much the same way as other American Standards. The new industry committee, known as the Highway Traffic Standards Committee, acts as general supervisor of the various projects in this field. Technical committees on which all organizations with an interest in the standard are represented by delegates of their own choosing, are in charge of specific projects. In many cases the work of member groups is utilized and broadened in the development of the national standard.

ASA traffic work has been widely used by governmental agencies. A few years ago when the Interstate Commerce Commission was preparing new regulations for the safety equipment of buses and trucks in interstate commerce, it called on the American Standards Association to develop standards upon which it could base these new regulations. This the ASA did and the resulting regulations, while increasing safety, lowered the cost of equipment so far as buses are concerned by about a hundred dollars per vehicle. This cost was estimated from local ordinances then pending or in force.

International Cooperation

THE American Standards Association serves as the channel through which American business cooperates with other countries in standardization matters. All the industrial countries have found it necessary to set up national standardizing bodies like the ASA. There are now such organizations in 25 countries. The ASA maintains cooperative relations with all of these, and carries complete files of their standards. The Association belongs to the International Standards Association (ISA), which serves as a clearing-house for the standardization work of the world just as the British, the Canadian, and the American bodies serve in their own countries. The ISA was organized in 1926 at a conference in New York, called by the ASA.

Today when America sells abroad, one of every four agricultural products, one of every three office appliances, one of every two crates of dried fruit, as well as automobiles and trucks, steels, chemicals, machine tools, and many other products, this international work of the ASA is important to business.

American industries through the Association are at present participating in 17 undertakings of the International Standards Association and also in 25 undertakings of the International Electrotechnical Commission. In each case the American industry concerned decides whether or not it wishes to take part in the work and to what extent. The ASA then provides the means by which such cooperation becomes effective.

These international contacts of the ASA help American industry by making promptly available to American manufacturers important developments in foreign standardization work, and by providing the means for participation in standardization projects in which business is interested.

Government Cooperation

THE Federal Government, as the nation's largest purchaser, is interested in a wide range of specifications for materials and apparatus; and through its great research and service bureaus it is interested in innumerable standardization questions. This interest is reflected in the close cooperation which exists today between the Government and the American Standards Association.

It is doubtful whether there is another organization in the country whose work provides as many significant examples of cordial and effective industry-government relations as does the work of the American Standards Association. This is true of both state and Federal governments. It is particularly marked in regard to standards of a regulatory nature and of government regulations which deal with technical matters. Examples of this are plentiful throughout the work, but especially in the Industrial Safety, Traffic, and Building Code programs (see pages 147, 149, 150).

Six executive departments of the Federal government—Agriculture, Commerce, Interior, Labor, Navy and War—and two independent establishments—the Federal Housing Administration and the Government Printing Office—hold membership in the American Standards Association. More than forty branches of the Federal Government are officially represented on ASA committees. In fact nearly every ASA project includes representatives of the Federal government or state governments or both. The National Bureau of Standards alone is active on a hundred projects.

The cooperative method of developing standards through the American Standards Association has been welcomed by such *Federal Agencies* as the Interstate Commerce Commission, the Bureau of Mines, the Departments of Labor and Commerce; by such *State Agencies* as Labor Departments, Industrial, Utility, Traffic and Highway Commissions; and by various municipal agencies.

Because of the way in which the work is developed and used, much of the vitality of the common law is to be found in American Standards, and the program provides an opportunity for industry to see that fair, reasonable, and effective provisions are written into the regulations under which it must operate.

This integrating work is helping to fill a need in our governmental set-up by bringing about a large degree of uniformity in the regulatory work of the 48 states. In some cases this extends to a three way relationship between the states, the federal government and industry.

Boren Introduces New Bill For U. S. Consumer Standards

A new bill by Representative Boren "to aid consumers by setting up standards of quality based on performance as a guide in the purchase of consumer goods" has been referred to the Committee on Interstate and Foreign Commerce. (H. R. 6652). The first section reads:

"That in order to provide technical guidance as an aid to consumers in making purchases of goods for household, personal, or individual use, the Secretary of Commerce, through the National Bureau of Standards, is hereby authorized and directed to establish and publish standards of quality for consumer goods (excepting foods, drugs, cosmetics, and other articles for which Federal standards are now provided by law), when in his judgment such standards are in the public interest. The Secretary of Commerce is further authorized to appoint an advisory committee to aid in selecting classes of goods for which consumer standards should be established, when he considers such assistance desirable."

Other sections include provisions for designating grades as A, B, etc.; distribution by the Bureau of lists of goods guaranteed by manufacturers to meet the standards; and authorization of an appropriation of $250,000 for the first year.

It is expected that hearings will be held during the present session.

EEI Electric Range Standards Reported in Final Stages

"Electric range specifications (a project started in 1932) are now in a final stage, the test prescriptions being similar to those promulgated last year for water heaters, and additional standards for service requirements are incorporated toward safety and reasonable durability."—*From a report of the Chicago convention of the Edison Electric Institute, "Electrical World," May 13, 1939.*

List of Publications On Accident Prevention

A list of its publications relating to accident prevention and safety (Letter Circular LC60) is now available from the National Bureau of Standards. The list gives the titles and prices of the publications which may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C.

ASA Highway Traffic Committee Elects A. M. Wolf Chairman

The new Highway Traffic Standards Committee, which was set up recently to coordinate the work of the American Standards Association affecting the operation of motor vehicles on the highway, has just elected A. M. Wolf, Society of Automotive Engineers, as its chairman. Louis R. Morony, American Association of Motor Vehicle Administrators, was elected vice-chairman.

Other members of the Executive Committee are:

E. W. James, American Association of State Highway Officials, and the U. S. Department of Agriculture, Bureau of Public Roads
Burton W. Marsh, American Automobile Association
Holger Jensen, National Conservation Bureau
S. J. Williams, National Safety Council
A. H. Vey, Institute of Traffic Engineers

The Highway Traffic Standards Committee has under its jurisdiction work of committees on inspection of motor vehicles, traffic control devices, colors for traffic signals, headlights, and railroad highway grade crossing protection.

New Underwriters' Standards For Connectors and Switches

Underwriters' Laboratories, Inc., have just issued a new standard for Pressure Wire Connectors and a revised edition of the Standard for Knife Switches.

Wire connectors submitted to the Laboratories for listing as approved after May 30 will be judged under the new standard, except that manufacturers will have the privilege of re-submitting under the previous requirements and obtaining listing on that basis until May 1, 1940, according to the Laboratories' announcement.

The new edition of the Standard for Knife Switches supersedes the edition of November, 1917, and becomes effective immediately.

All Tentative Standards To Be Reconsidered by ASA

After January 1, 1941, all American Tentative Standards are to be reviewed by the ASA committees having them in charge. They will then be resubmitted to the American Standards Association, either with or without revision, for consideration as American Standards. Standards which are not resubmitted will be dropped from the list of approved standards. The decision to carry out this policy was made by the Standards Council at its meeting April 27.

American and Foreign Aeronautical Experts Meet to Discuss International Standards

FOREIGN aeronautical experts, in New York to attend the World Automotive Engineering Congress of the Society of Automotive Engineers, met with American experts May 15, 16, and 17 under the auspices of the American Standards Association to discuss international standards for aircraft engines, aircraft parts, and aircraft fuels. Arthur Nutt, vice-president in charge of engineering, Wright Aeronautical Corporation, is chairman of the ASA Advisory Committee on Aeronautics which suggested the informal conferences on aircraft standardization, and acted as chairman of the conference on aircraft engines. T. P. Wright, vice-president in charge of engineering, Curtiss-Wright Corporation, and A. L. Beall research engineer, Wright Aeronautical Corporation, served as chairmen of the other two sessions.

Worldwide agreement on aircraft parts would alleviate the very serious problem which American manufacturers must face in servicing the engines and aircraft which they sell abroad, the ASA Advisory Committee agreed at its meeting February 28. From the point of view of the public this international work would make airplane travel safer by tending to unify the safety regulations of various countries and by providing a common ground for the exchange of experience. It would enable the airplane operator who has crossed his own border readily to get the more common supplies and replacement parts for his plane and to refill his tank with fuel that does not require readjustments of his engine. Thus this international work would facilitate commercial air travel, discussions in the committee indicated.

Need for Standards

In welcoming the international group, Edmund A. Prentis, president of the American Standards Association, and John A. C. Warner, general manager of the Society of Automotive Engineers, pointed out the practical need for standards of interchangeability for airplane parts which had led the American aeronautical industry to a decision to participate in international work in this field.

"As sponsor for the American phases of this aeronautical standardization project," said Mr. Warner, "the Society of Automotive Engineers sees a chance to produce results of an importance even greater than those which have accrued from its 20 years of study work in the field of aeronautic standards."

The International Standards Association has for some time had a committee on aeronautics on which most of the European countries are represented. The aeronautical industry of the United

Experts Who Attended Meeting On Aeronautical Standards

American and foreign experts on aeronautics who showed their interest in the possibility of developing international standards for aircraft engines, parts, and fuels by attending one or more of the three sessions held under the auspices of the American Standards Association in New York, May 15, 16, and 17—

American Airlines, Inc., *Gilbert Brower*
Associated Ethyl Co., Ltd., London, *F. R. Banks*
Civil Aeronautics Authority, *John Easton*
Curtis Wright Corp., *T. P. Wright; John W. Dunn*
Eclipse Aviation Co., *D. J. Deschamps*
Fiat Company, Milan, Italy, *C. F. Bona*
Isotta Fraschini Co., Milan, Italy, *Th. J. Jervis*
National Advisory Committee on Aeronautics, *J. E. Reid*
National Research Council of Canada, Ottawa, Ont., *J. W. Broughton; M. S. Kuhring*
Pan American Airways, *Jos. J. Dysart*
Ranger Engineering Corp., *C. E. Carrigan*
Seversky Aircraft Corp., *Roland C. Bergh*
Shell Oil Company, *Major J. H. Doolittle; L. E. Hebl*
Society of British Aircraft Constructors, London, *H. W. Goodinge; Frank Nixon*
Standard Oil Development Company, *Robert E. Ellis*
Texas Company, *Neil MacCoull*
Tire and Rim Association, *Parry Keller*
United Aircraft Corp., Pratt and Whitney Division, *John B. Sanborn*
United Aircraft Corp., Vought-Sikorsky Divisions, *J. L. Harkness*
Wright Aeronautical Corporation, *A. L. Beall; Gustaf Carvelli; Arthur Nutt*

In addition to the experts on aeronautics, representatives of the American Standards Association and the Society of Automotive Engineers attended the three sessions.

States, represented on the ASA Advisory Committee, decided at the meeting of this committee last February to take an active part in the work of the ISA committee. Its recommendations on international problems will be expressed through a new committee on Standardization in the Field of Aeronautics which it recommended be organized by the American Standards Association. This recommendation has been approved by the ASA and the organization of the new committee, for which the Society of Automotive Engineers will take the leadership, is now going forward.

24 International Committees Plan Meetings in Finland

TWENTY-FOUR technical committees of the International Standards Association will meet at Helsingfors, Finland, from June 26 to July 8. The meetings are being held at Helsingfors at the invitation of the national standardizing body of Finland, Finlands Standardiseringskommission.

The international committees which are meeting this year, and the dates of their meetings, are:

Title	*ISA Project*	*Meeting Date*
Ball bearings	4	June 30, July 1
Drawings	10, group 2	July 6, 7
Flow measurement by means of nozzles and diaphragms	30	June 27, 28
Lock washers	2b/2	July 5
Machine tools—	39	July 6, 7
Acceptance specifications (subcommittee)	39	July 3, 4
Petroleum products—		
Acid number	28a/8	June 29
Hard asphalt and impurities	28a/21	June 30
Saponification number	28a/9	June 29
Geology and geophysics	28b/1	June 30
Refining	28b/3	July 1
Petroleum Products (cont.)		
Transport, storage and distribution	28b/6	July 1
Shaft extensions	14	July 3, 4
Shafting keys	16	July 5, 6
Ships elements (seagoing ships)	8a	June 27, 28, 29
Sieves	24	June 29
Standard diameters	19	July 5
Terminology	37	June 27, 28
Textiles (A)	38a	July 5, 6
Textiles (B)	38b	July 6, 7
Tools	29	July 1, 3, 4
Upholstery hair	40	July 4
Welding apparatus and tools	44/2	June 27, 28
Wood screws	2b/5	July 3

After the series of meetings of ISA technical committees, a meeting of the ISA Council will be held July 7 and 8. The Council is made up of the president, Senator G. Tofani of Italy, and representatives of the national standardizing bodies of Belgium, Finland, Great Britain, Holland, Switzerland, and the United States. Dr. P. G. Agnew, secretary of the American Standards Association, represents the ASA on the ISA Council.

Motion Picture Engineers Adopt American Standard Abbreviations

The Society of Motion Picture Engineers has adopted as uniform practice for all its publications the Abbreviations for Scientific and Engineering Terms approved as American Tentative Standard by the American Standards Association in 1932. These abbreviations were recommended to the ASA by a committee under the leadership of the American Association for the Advancement of Science, the American Institute of Electrical Engineers, the American Society of Civil Engineers, the Society for the Promotion of Engineering Education, and the American Society of Mechanical Engineers.

Copies of the standard (Z10i-1932) are available from the ASA at 40 cents each.

British Label to Indicate "Radio-Interference Free" On Electrical Apparatus

A trade mark known as the "Radio Interference Free" mark was registered recently by the British Standards Institution for use by British manufacturers of electrical apparatus to indicate that their product complies with the British Standard Specification on Limits of Radio Interference. Use of the mark, which was registered under section 37 of the British Trade Marks Act of 1938, will be controlled through licenses issued by the British Standards Institution. Manufacturers in countries outside of Great Britain may use the mark provided the agent in Great Britain who imports their product holds a license.

Tests May Give Data for Revising Standard for Screw Threads

A SERIES of tests to determine what influence errors, elasticity, and plasticity may have on the strength of screw threads is to be carried out at the Massachusetts Institute of Technology under the supervision of a special subcommittee of the ASA Committee on the Standardization and Unification of Screw Threads. These tests will be used by the subcommittee as a basis for recommended changes in the present American Standard for Screw Threads. The subcommittee's recommendations will probably result in a revision of the standard to specify more accurately those properties of a threaded product which will insure satisfactory service.

The decision to appoint the subcommittee was made by the ASA committee at its meeting April 19. At that meeting, it was brought to the attention of the committee that many difficulties are being met in manufacturing according to the present standard, and that certain types of failure are being encountered in service. The discussion in the meeting brought out that:

1. The present standard specifications grade the product into classes on the basis of accuracy of diameters.

2. Analysis indicates that the difference in strength, because of difference in diameter, between the extreme classes may amount to as much as three to ten percent.

3. Analysis indicates also that possible errors in lead under present specifications may reduce the strength as much as seventy percent.

4. Endurance tests indicate that the rounded roots of the Whitworth form of thread give up to forty percent greater strength than the American National form with flat roots.

5. Endurance tests indicate that the endurance limit of heat-treated steel bolts and nuts is little, if anything, greater than that of soft steel bolts and nuts.

6. Service data indicates that heat-treated steel bolts must be mated with soft steel nuts to obtain any benefit from the heat-treatment.

7. Analysis indicates that when the lead of the thread of the bolt is greater than that of the nut, the strength is much less than when the lead of the thread of the bolt is less than that of the nut.

8. It appears possible that specifications which give a satisfactory product when the softer and more ductile materials are used may give an entirely unsatisfactory product when harder, heat-treated materials are used.

The American Standard for Screw Threads (B1.1-1935) was originally prepared and approved in 1924 and was revised in 1935. The committee in charge of the standard is working under the leadership of the American Society of Mechanical Engineers, and the Society of Automotive Engineers. Ralph E. Flanders, president of the Jones and Lamson Machine Company, is chairman, and Earle Buckingham, professor of mechanical engineering, Massachusetts Institute of Technology, is secretary.

Commercial Standard for Oil Burners Circulated for Approval

Recommended standard specifications and methods of test for automatic mechanical draft oil burners are being circulated by the National Bureau of Standards for acceptance by industry. The proposed standard, which is being recommended as minimum requirements for the guidance of manufacturers, distributors, and installing contractors cover manufacturing and production tests, laboratory requirements and test procedure, installation requirements and performance tests, and an oil burner certificate to be placed with each burner installation.

Mimeographed copies of the proposed standard are available from the National Bureau of Standards, Washington, D. C.

Simplified Practice Recommendation Reduces Variety of Cartridges

A revision of Simplified Practice Recommendation R62-37, Metallic Cartridges, which reduces the stock varieties of rifle and pistol cartridges by 23 per cent, was accepted by industry and became effective April 1. With reductions made in earlier editions of this recommendation the total reduction in variety now amounts to 57 per cent.

The schedule as now revised also shows fewer classifications. It merges under center-fire cartridges the items previously grouped under center-fire pistol and center-fire rifle cartridges. In addition to ball, blank, and shot center-fire cartridges, the program covers rim-fire cartridges of similar types.

Until printed copies are available, mimeographed copies of this Simplified Practice Recommendation may be obtained without charge from the Division of Simplified Practice, National Bureau of Standards, Washington, D. C.

New Standard Clarifies Terms Used for Cutting Tools

IN AN attempt to clarify a confusing situation in which a tool may be called a left-hand tool in one company, but may be known as a right-hand tool in another company, a new standard defining the terms used in speaking of the different types of single-point cutting tools, the parts of those tools, and the angles at which they are used was approved recently by the American Standards Association.

Several years ago the ASA received a request for information about American practice in designating lathe tools, and referred the question to half a dozen experts, all members of the ASA Committee on Small Tools and Machine Tool Elements. The replies showed about a fifty-fifty division. What one expert called a "right-hand straight turning tool" was designated by another as a "left-hand straight roughing tool." A tool called in one reply a "left-hand side boring tool" was called a "right-hand hook tool" in another, and again, a "right-hand boring tool" in a third reply.

It was obvious that there was need for agreement on a standard vocabulary. The problem was placed before the ASA Committee on Small Tools and Machine Tool Elements, and as a result a subcommittee on Nomenclature and another on Single-Point Cutting Tools were appointed to consider recommendations for standard terminology and definitions.

The subcommittee on Single-Point Cutting Tools was organized in December, 1933, and consists of two members: Fred H. Colvin, editor-emeritus of *American Machinist*, and O. W. Boston, director of the Department of Metal Processing, University of Michigan.

This subcommittee drafted a proposal for terminology and definitions of single-point cutting tools for lathes, planers, shapers, turret lathes, boring mills, etc. The drafts it prepared were correlated with similar material worked out by a subcommittee of the ASME Special Research Committee on Cutting of Metals which was preparing the text of a handbook on metal cutting.

The final proposal, approved by the ASA Committee on Small Tools and Machine Tool Elements, was recommended to the ASA by the organizations taking the leadership in the committee's work, the Society of Automotive Engineers, the National Machine Tool Builders' Association, and the American Society of Mechanical Engi-

ASA Committee Completes 12 Standards for Machine Tools and Elements

The ASA Committee on Standards for Small Tools and Machine Tool Elements (B5), which recommended approval of the new American Standard Terminology and Definitions for Single-Point Cutting Tools, is working under the joint administrative leadership of the American Society of Mechanical Engineers, the National Machine Tool Builders' Association, and the Society of Automotive Engineers. This committee has already completed 12 standards in its field, including standards for taps, T-slots, jig bushings, milling cutters, forming tool blanks, chucks and chuck jaws, and lathe spindle noses for turret and automatic lathes. Other work which remains to be completed includes, among others, standards for punch press tools, milling machine tables, twist drills, and reamers.

The officers of the ASA committee are:

W. C. Mueller*, American Society of Mechanical Engineers, *Chairman

Frank O. Hoagland*, National Machine Tool Builders' Assn., *Vice-Chairman

Joseph A. Anglada*, Society of Automotive Engineers, *Secretary

neers. It was approved by the ASA in January, 1939.

The standard is divided into six sections:

Tool elements
Types of tools
Tool angles
Working angles
General tools
Symbols

The section on Tool Elements gives definitions of the following features of a tool: size; shank; base; heel; face; point; cutting edge; nose; shape; flank; neck; flat; and chip breaker or control. Some of the sketches given in the new standard to illustrate these tool elements are reproduced here.

In the second section, Types of Tools, the following types are defined: ground tool; forged tool; tipped tool; curved cutting edge tool; raised face tool; bit tool; tool holder; tool bit; straight tool; bent tool; offset tool; right-cut tool; left-cut tool; and end-cut tool. It will be noted that the terms "right-hand" and "left-hand" have been dropped, the new designations being "right-cut tool" and "left-cut tool." The definition of a right-cut tool is explained in a footnote: "When such a tool is used in an engine lathe, the cutting edge is on the left side. It is fed into the work from right to left, as when cutting a right-hand screw thread."

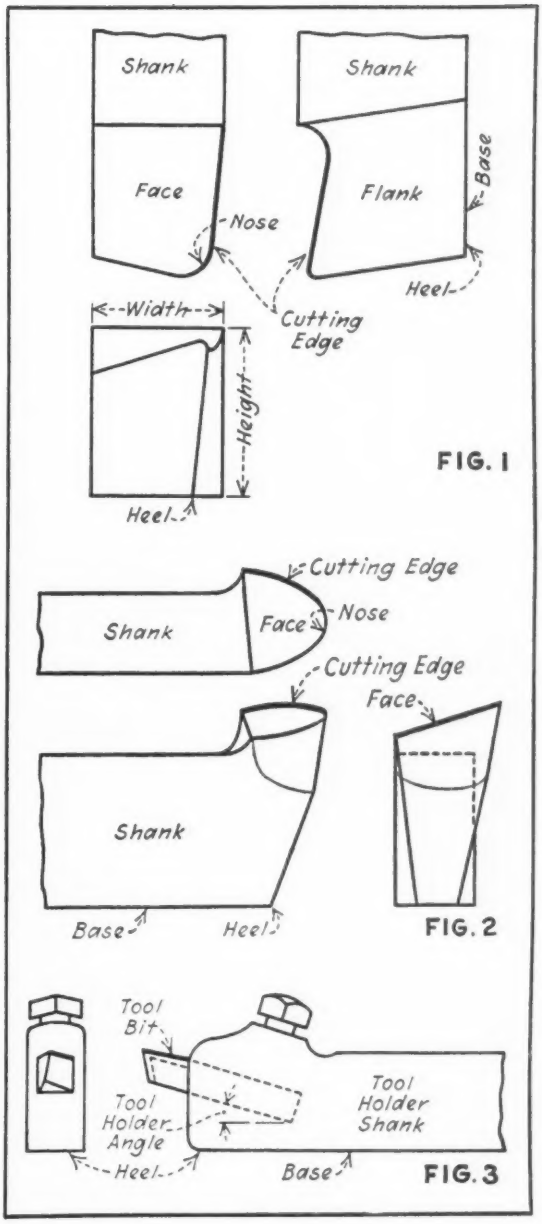
Figure 1 in the illustration reproduced here shows a ground tool, and figure 2 a forged tool.

The third section, on Tool Angles, gives definitions of the following: tool-holder angle; shank angle; back-rake angle; side-rake angle; relief angle; side-relief angle; end-relief angle; clearance angle; side-cutting edge angle; end-cutting-edge angle; nose angle. The tool-holder angle is illustrated in Figure 3. Those interested in this subject know that on occasions there is considerable discussion among experts about the terms "relief" and "clearance." It is hoped that the new standard will provide the necessary standard language to settle such discussions.

Supplementing the definitions of the angles for an individual tool, the fourth section on Working Angles gives definitions for those angles between tool and work which depend not only on the shape of the tool but also on its position with respect to the work. The angles defined here are: setting angle; entering angle; true-rake angle; cutting angle; working-relief angle; working-end-cutting-edge angle; and lip angle.

Under the fifth head, General Terms, definitions are given for cutting speed; depth of cut; feed; machined surface; and work surface.

Finally, the section on Symbols gives a recommended system for designating tools by means of symbols that may be used with advantage in catalogs, purchase orders, etc. RC-S, for example, means right-cut single-point tool, with straight shank (see Figure 1).



General adoption of these symbols will simplify transactions and avoid confusion which may at times prove costly.

Copies of the American Standard Terminology and Definitions for Single-Point Cutting Tools for Lathes, Planers, Shapers, Turret Lathes, Boring Mills, etc., (B5.13-1939) are now available at 40 cents each.

Toward Better Sizes for Children's Garments

by

W. R. Waters[1]

Chairman, Technical Subcommittee on Standard Garment Sizes, of the ASA Committee on Standardization of Sizes of Children's Garments and Patterns

MANY troublesome situations in the retail trade can be solved only through the use of standards—standards which make it possible for retailer and consumer on the one hand, and retailer and manufacturer on the other, to speak the same language in their mutual transactions.

A Headache for Everyone

One of the very worst of these situations is that of sizes for children's garments. It is a headache for everyone. Difficulty in selecting properly fitting clothing causes endless trouble and dissatisfaction to customers. It provides the retailer with one of the worst examples of the returned goods evil. The retailer in turn passes back to the manufacturer as many of his troubles as he can.

A frontal attack on the job of setting up fundamental standards to clarify the situation is now actively under way. The job is being done through the closest cooperation between manufacturers, retailers, and consumers.

Women's groups have been agitating for reform for years, but hitherto the necessary facts for a fundamental solution of the problem have not been available.

Now, fortunately, the U. S. Bureau of Home Economics has been enabled through grants by the Works Progress Administration and with the help of the National Youth Administration to carry out an extensive investigation on the body dimensions of children. This research job has provided all of the information necessary for setting up fundamental body measurements as the basis for a system of garment and pattern sizes. In the Bureau's study, 36 measurements were made on each of 147,000 boys and girls from 4 to 17 years of age. This includes boys and girls from representative sections of the country, from various economic groups. Every effort was made throughout to keep the survey truly representative of the child population of the United States. The 36 measurements made on each child —for example, stature, length of arm, length of trunk, girth of chest, girth of waist, leg, and arm —are the principal measurements which enter into the fit of garments. They furnish enough data to enable a sculptor or model maker to fashion an accurate statue of each child.

This study is the first of its kind for a civilian population and is unquestionably the finest and most useful work on the subject that has been done anywhere. Much complex statistical computation has been necessary in order to reduce the whole mass of figures to a few simple tables that can be readily applied to the development of new size standards. The measuring job and the statistical analysis have been carried out with scrupulous care.

The entire research work has been carried out under the direction of Miss Ruth O'Brien of the U. S. Bureau of Home Economics. The statistical part of the work is being done under the direction of Meyer A. Girshick.

The standardization work itself is in the hands of a committee of the American Standards Association (ASA) upon which all elements of the

[1]Representative of the Limited Price Variety Stores Association, Inc., on the ASA Committee on Standardization of Sizes of Children's Garments and Patterns.

trade—model makers, pattern makers, garment manufacturers, department stores, chain stores, and mail order houses—the consumer groups, and the Federal Goverment are officially represented. This is the first time that these groups have ever sat down together to discuss the problem of children's garment sizes. Mrs. Harriet Howe of the American Home Economics Association is chairman of the committee.

The research job has confirmed what had already been widely suspected, that the root of the present messy situation in sizes of children's garments lies in the fact that the method now used in designating sizes by age is wrong. In fact, if you wanted to choose that one of the 36 indices determined by the Bureau which is the worst indication of a child's size, you would find it to be age. In addition to the fact that age is inherently bad, manufacturers mark garments which differ widely in actual dimensions with the same age designation. There is no standard which is now being followed by the trade. But even if there were complete national uniformity in sizing by age, the situation would still be bad, because as the research job shows, age is a very poor gage of the size of a child.

Government research gives basic data needed for determining "typical" child sizes before standard garment sizes can be studied

Garment industry is using research results to solve vexatious problem through development of new standards

The investigation has brought together a wealth of information and of exhibits confirming these facts. For example, the lack of uniformity in marking garments is illustrated by a suit marked as an eight-year-old size which is inches larger than a suit marked as a ten-year-old size. The inherent inadequacy of age as an index is illustrated by the fact that children ranging in age from four to 13 years may fall into the same

Present at Subcommittee Meeting in Washington

Left to right:—Harry Simons; A. E. Craig; M. A. Girshick; N. R. Oliver; R. Darney; W. R. Waters, Chairman; B. J. Antolini; Julia McHugh; Dorothy S. Brady. Other members are: Dorothy Ashworth, Roy Cheney, Alice Edwards, Harriet Howe, J. J. Lubell, Ruth O'Brien.

height group, the average age for the group being eight years.

Standard Body Sizes Immediate Objective

One of the first conclusions reached by the ASA committee when it began to study the research findings was that it could not proceed immediately to set up standard garment dimensions, but that first there must be set up a series of standard body sizes which could be used in constructing a series of models, each representing an artificial "average" child. All of these models together, when constructed, would represent the series of coordinated measurements developed into body forms that would produce better fitting garments for the child population of the country.

The Bureau's work has yielded the data necessary for the accurate dimensioning of such a series of models, once the basis of dimensioning the models has been decided upon.

These data show that no one of the 36 measurements made on each child taken alone is correlated closely enough with the other 35 dimensions to serve as an adequate index of body measurements. The reason for this obviously is that the human body has both a bony structure (built on vertical lines) and a fleshy structure (attached to the bony structure in horizontal planes) and there is so little coordination between the development of these two fundamental structures that no one index, such as "height," "age," "girth of hips," alone will predict the actual body shape or size well enough to be used as a basis of sizing. It was after taking this fact into consideration that the subcommittee agreed that the development of the series of measurements for body forms should be based on the stature and girth of hips combination. From these two figures, the research data enable all the 34 other dimensions to be calculated, thus enabling the sculpture of the actual models or forms.

The ASA committee considered three such pairs of indices for developing body sizes. Partly as a result of the data yielded by the investigation and partly as the result of practical considerations based on the experience of the trade, the committee decided that height and girth of hip are the best combination of indices for the development of a series of figures from which could

ASA Committee on Standards For Children's Garment Sizes

The ASA Committee on Standardization of Sizes of Children's Garments and Patterns, which brings together representatives of the various branches of the industry, as well as consumers, and Government representatives, has the following membership:

Harriet R. Howe*, American Home Economics Association, *Chairman

H. M. Lawrence*, American Standards Association, *Secretary

American Association of University Women, *Ruth Ayres, Kathryn McHale*

American Home Economics Association, *Katharine M. Ansley, Ardenia Chapman, Alice Edwards, Harriet Howe, Inez LaBossier, Lillian Locke*

J. R. Bauman Normal Model Form, Inc., *S. Weinstein*

Bauman's Original Designs, Inc., *J. R. Bauman, C. W. Meyer (alt.)*

American Retail Federation, *David R. Craig*

The Butterick Company, Inc., *M. Lonie, C. M. Payne (alt.)*

Cavanaugh Form Company, Inc., *P. C. Cavanaugh, Raymond Darney (alt.)*

General Federation of Women's Clubs, *Saidie Orr Dunbar*

Industrial Council of Cloak, Suit & Skirt Manufacturers, *Julius Katz, Samuel Klein, Hugo Rudinger*

International Association of Garment Manufacturers, *A. F. Allison*

Limited Price Variety Stores Association, Inc., *F. W. Kuhner, Paul S. Nystrom, W. R. Waters*

McCall Corporation, *Mayer Rohr*

National Association of Home Demonstration Agents, *Florence Carvin, Lois D. Mathewson, Grace Smith (alt.)*

National League of Women Voters, *Ruth Ayres, Marguerite M. Wells*

National Retail Dry Goods Association, *Charlotte W. Abbott, Helen Alexander, Helen P. Knappe (alt.), W. H. Bingham, B. J. Antolini (alt.), A. C. Icke, K. MacGregor, Dorothy Ashworth (alt.), Julia McHugh, Donal G. Murphy*

Simplicity Pattern Company, *Caroline Hutchins*

Underwear Institute, *Roy A. Cheney, Francis E. Simmons*

United Infants' and Children's Wear Association, *Jacob J. Lubell, Max H. Zuckerman*

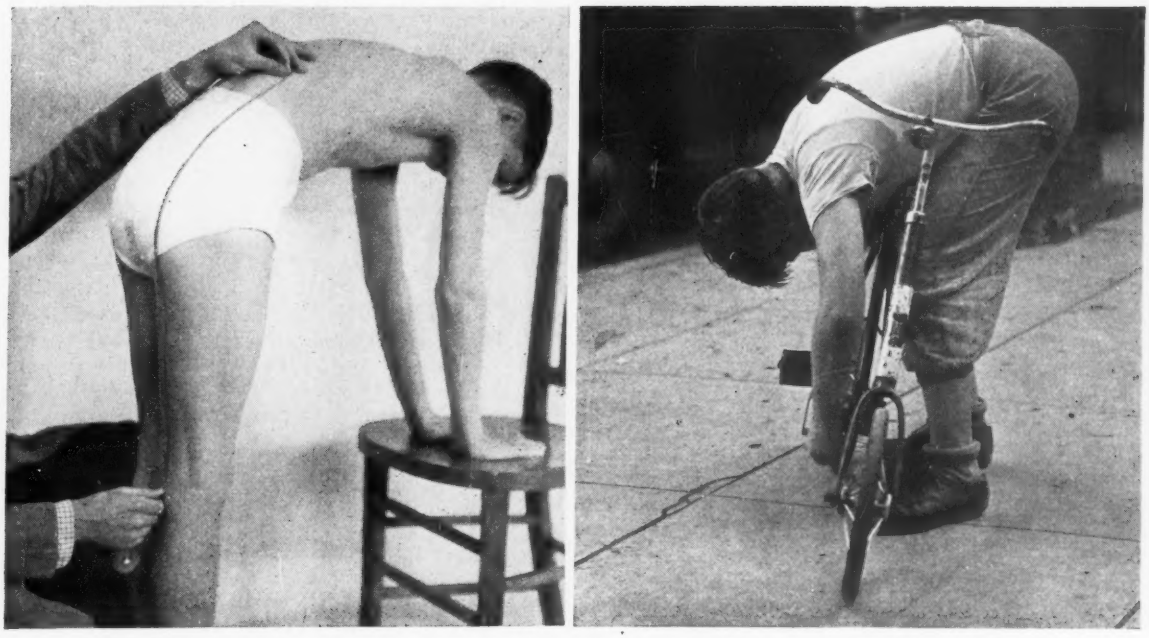
U. S. Department of Agriculture, Bureau of Home Economics, *Ruth O'Brien, Meyer A. Girshick (alt.), Louise G. Stanley*

U. S. Department of Labor, Bureau of Labor Statistics, Retail Price Division, *Ethel D. Hoover, Stanley Stewart*

U. S. Department of Agriculture, Consumer Standards Project, *S. P. Kaidanovsky, D. E. Montgomery*

The Vogue Pattern Service and The Hollywood Pattern Company, *Norman R. Oliver*

Member at Large, *Harry Simons*



Measurements were taken corresponding to the activities of a child

be produced a series of "body forms," such as has been outlined.

At the request of the subcommittee, the Bureau of Home Economics made a large number of special computations in connection with this very fundamental problem.

The technical subcommittee studied other parts of the problem and has now made a report on its findings and recommendations for the next steps to be taken.

The first of its recommendations is that height and girth of hip be used as the basic measurements for coordinating the other measurements for the body sizes.

A second decision yet to be made is that of determining the number of intervals or the number of models to be provided for in the series of master sizes to cover the child population. This is probably the most important decision in the entire undertaking. The more sizes the better the fit. But every added size adds something to the cost of the garment, for each added size slightly increases the cost to the model and pattern makers, to the garment manufacturer, to the wholesaler, and especially to the retailer who is thereby forced to carry a larger stock. On the other hand, too small a number leads to losses in other directions—fewer sales, more customer dissatisfaction, more returns. The subcommittee recommended that in setting up the body sizes the entire field be sufficiently well covered to enable every manufacturer to make his garments to provide for as many sizes as he wishes, no one, of course, being under any obligation whatever to make a line to cover all standard sizes.

Body Sizes to Be Developed Into Garment Sizes

After the number of models and their measurements have been determined, the committee will then be faced with the problem of identifying these with some sort of designation that will be applicable for use in the manufacturing and retailing of garments made from such forms. It is obvious from the above discussion that in identifying the size of garments for which the patterns have been worked out from the above-referred-to body forms two indices are necessary as an accurate guide, one of which will take account of the bony structure and one of which will take account of the fleshy structure. This two-index principle is already used in sizing men's trousers, the combination of dimensions in this case being the "girth of waist" and "length of leg." The method at present in use is the age designation. This manifestly is out, because it is precisely this method of designating sizing which has put us in the mess we are in today.

Obviously two methods are open. One is to set up an arbitrary system of size numbers from 1 to 45 or 50 and then have a table of the actual master dimensions to which the parent and the sales person could refer.

Another, and we believe, a far superior method

Two eight-year-old girls in size 8 dresses

would be to follow the method now used in men's trousers; namely, giving the actual figures of the two master dimensions. In the case of trousers, this is the waist measurement and the leg length; in children's garments it *could* be height and hip, it might be height and chest and it could even be height and weight. It would be directly available to the sales person and to the parent in measuring the child to be fitted. This simple directness would go a long way in avoiding mistakes and misunderstandings.

Or, finally, it might be possible to combine these two ideas into a combination of number identification supported by two measurement combinations such as is already in use in some manufacturers' lines.

If this third idea were to be used, the size number identification would be primarily for simplifying the identification of garments in making out orders, in the handling of stock, and other mechanical merchandising procedures. The two-measurement index would be the one with which the customer would be primarily concerned. For example, let us assume that it was decided to use, in addition to a number identification, the two-measurement combination of height and girth of hips. The customer would be able before coming into the store, with the use of only one measuring device such as a tape measure, to measure the height and girth of hips of her child and would select from the stock of garments that garment on which the height and girth of hip combination of measurements were nearest to the actual measurements of her child.

The subcommittee further recommended that after the body sizes have been decided upon, the full committee continue on a program of actual garment sizes.

This report of the subcommittee, including its recommendations, has been approved by the full committee as a basis for its further work.

Bureau Recommends Sizes for Consideration by Industry

Following acceptance of the subcommittee report, the Bureau of Home Economics recommended 13 regular sizes and 26 auxiliary sizes for boys, and 12 regular and 24 auxiliary sizes for girls for the consideration of the industry. These sizes represent 89 per cent of the boys measured; and 86 per cent of the girls.

All of these recommendations—that height and girth of hip be used as the basic measurements; that sufficient number of sizes be chosen to cover the entire field; that height and girth be used on the garment, perhaps with additional data, for designating size; and the Bureau's recommendations on the actual body measurements—are being carried by the members of the ASA committee back to the organizations which they represent on the committee for study.

It will thus be seen that the general plan is to continue this close cooperative work of Industry, Home Economists and other Consumer Groups, and Government, through their representatives on the ASA committee.

The immediate goal is national agreement upon a standard system of body measurements. The ultimate goal is a greatly improved system of standard garment sizes.

In my opinion half of the battle will have been won as soon as agreement is reached on a standard series of body sizes and as soon as the master dimensions of these appear on labels. Most of the headaches will have been relieved—the headaches of the parent, of the manufacturer, and of the store executive.

The economic advantages to be gained are very great. I believe that the gain to the stores alone in improvement in the returned goods problem, and still more in increased consumer satisfaction, will be measured in millions of dollars.

How Industry and Government Work Through British Standards Institution

by

P. Good

Deputy Director, British Standards Institution

The standardization principles under which British industry and the British Government cooperate in the development of national standards through the British Standards Institution are described by the Deputy Director of the BSI in this article

Both the British national standardizing body and the American Standards Association operate in much the same way

GOODWILL on the part of industry is needed if we are to have voluntary preparation and use of Standards—Standards of performance or dimensions; a simplified program of types and sizes; or standard measures for any of the characteristics which go to make up that often not easily defined thing—quality, or fitness for purpose.

National standards bodies must assure that their machinery is designed to secure the maximum of willing effort, and for this reason industry must participate intimately in its work.

In Great Britain, the British Standards Institution (BSI) is an industrial organization run by industry with the cooperation of the Government, county and municipal authorities, public utility corporations, producers, and users. The central Government contributes not only by assisting the committees with the advice of its staff and their research work but also by a direct financial contribution of some $25,000 a year towards the cost of running the organization.

In each industry the work of standardization is under the supervision of an Industry Committee. (There are now 21 such committees). These Industry Committees have almost complete autonomy. They are formed by nominees of the various industrial organizations, professional bodies, and Government departments interested. The chief executives generally represent their organizations on the Industry Committees, although these Committees delegate the actual detail work of preparing the standards to technical and subcommittees.

The Industry Committees are grouped under Divisional Councils representing the larger grouping of work, such as Building, Chemistry, and Engineering. These are in turn controlled by the General Council. The Councils are partially nominated and partially elected by the Industry Committees grouped under their control.

It should be noted that the principal organization representing the producing interests in this country (the Federation of British Industries), and an organization representing commerce generally (the Association of the British Chambers of Commerce), have, through the constitution, the right of nominating a member to the General Council of the BSI. This right secures effective commercial and industrial contact where questions of policy are concerned.

It has been found quite impracticable to allocate seats on an Industry Committee by any form of representation that gives seats in proportion to relative importance. Industrial control is secured

by the fact that no work is started by the Industry Committee without the support of the principal producing and using groups of industry and no specification is issued without general consent being obtained. This consent is a reality in that any responsible branch of the industry, regardless of its representation on the Industry Committee, can prevent the promulgation of any standard.

In the case of some of the larger industries there are research organizations which actively assist the Industry Committee in the preparation of standards. Such organizations, which in most cases are maintained by, and are representative of the industry itself, provide a second or parallel link with industry.

The growth of trade associations, concerned with a particular branch of industry, where all the various problems appropriate for co-operation are discussed, has provided the means for securing most effective and intimate contact with industry for standardization purposes. Often these bodies form standardization committees within themselves to assist the national standards body.

Trade Associations Comprehensive

Some of the trade and industrial associations embrace practically the whole of their branch of industry; others are not so comprehensive. It has now become a general rule to secure representation only from these associations wherever they are reasonably comprehensive, the representatives being nominated to represent their whole membership and not any one firm. Where there is still a substantial non-association group, the more important among these companies are often called together and invited to name a representative.

Every effort is subsequently made to see that organizations represented on committees get full particulars of the proposals early enough to offer advice or protest.

BSI on Government Committees

A number of years ago His Majesty's Government established Inter-Departmental Committees on General Stores, whose terms of reference (or scope) are: "To consider the standardization, wherever practicable, of the specification and design of commodities and stores common to and in use by the three Services, and to adopt, wherever possible, trade standards or patterns for this purpose". The BSI is represented on these committees and subcommittees. This makes it possible for the producing industry concerned to participate and express its views without embarrassment. On completion of any draft Government inter-departmental specification, the BSI is charged with the duty of consulting the industry concerned with that particular material to ascertain whether the specification is satisfactory, and whether the material specified is a normal article of commerce which can be readily obtained.

It is becoming the practice of the various Authorities in this country who are charged with the responsibility of drawing up Rules and Regulations to make reference in their Rules and Regulations to the British Standard Specifications for materials, etc. A significant development is to be found in the practice of these Regulations-making Departments of Government and Municipal Authorities of submitting the draft Regulations to the BSI Committee concerned with the materials involved in those Regulations, for their consideration, in order that industrial comment may be obtained prior to the issue of the Rules and Regulations.

Reaffirm Simplified Practice Recommendations

Simplified Practice Recommendations reaffirmed by the standing committees of the industries concerned include the following, according to recent announcements of the National Bureau of Standards:

Containers for extracted honey R156-37
Tinned-steel ice-cream cans R164-36
Vitrified paving brick R1-36

Copies of these recommendations may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for five cents each.

American Standard for Ladders, Guide to Safe Equipment

"Working overhead under any circumstances is hazardous. Failing to use a proper ladder or scaffold and failing to use common sense are invitations to accidents.

"State ladder codes, setting forth minimum requirements for the safe construction of ladders, will help you as a guide in selecting good equipment. An additional guide is to make certain that the ladder has been manufactured according to the specifications contained in the National Ladder Code of the American Standards Association."—*From Occupational Hazards and Safety, May.*

Electrical Manufacturers Cooperate in A National Standardization Program

by

C. M. Cogan

Manager, Engineering Department,
National Electrical Manufacturers Association

NEMA, and other trade associations and technical societies which have effective standardization programs, coordinate their standards through the American Standards Association to eliminate duplication of effort, and conflicting requirements

THE National Electrical Manufacturers Association (NEMA) is a trade association. Its members consist of manufacturers of electrical products ranging all the way from small snap switches to large turbo-generators. These products are covered by more than 80 groups, each functioning under a common, well-planned standardization procedure and under the supervision of a Standing Committee known as the Codes and Standards Committee. This is the committee which guides the association's entire standardization activities, both within NEMA and in cooperation with other associations. Thus, we have a number of individual product units which are called divisions, sections, or groups linked together through a central guiding committee.

The sections, consisting as they do of companies who manufacture the same kind of product, have many common interests. Standardization is one of them, and judging from the record for the past twenty years, it is the largest one. The value of standardization was recognized early in the history of the electrical industry. Standard methods of rating and testing, and of specifying performance, and many other features, are all basic considerations which are necessary to everyone concerned with the electrical industry—manufacturers and others. Unsatisfactory trade conditions, pressure from manufacturers, utilities, consumers, or electrical inspectors are all causes which give rise to standardization. In response, the member companies voluntarily carry on standardization programs in their respective sections.

Although the projects, which are set up for each succeeding year, are well-founded and widely supported, they would be ineffective without appropriate guidance and supervision. The staff cannot do this. It requires a committee having seasoned judgment and well-rounded views. In the case of standardization projects, this is the Codes and Standards Committee. This committee consists of eighteen members, selected for their wide experience and good judgment. The committee examines, correlates, obtains assent, and finally approves standards developed by the sections and sees that they are properly correlated.

In NEMA, the section is the heart of the association. Usually, it is here that the need for standardization becomes apparent. This is not difficult to understand when one realizes that each member of the section represents a manufacturing concern with an organized structure behind it. Some concerns are large, others small, but all are alive to factors which influence their business. Notwithstanding this fact, the work is handled on an entirely voluntary basis and each member company, regardless of its size, has but one vote on all questions.

Section Organization

In general, the individuals who make up the section are of both the executive and the engineering type. The two personalities are actively engaged in the work on all standardization questions; thus, balanced judgment is bound to result. As in the case of the ASA committee, a section may organize as many committees as necessary to handle the questions at issue. Most of the committees concerned with standardization subjects work as technical committees or engineering committees.

As would be expected, technical or engineering committees consist largely of engineers. They are

selected from the ranks of the member companies comprising the section. In these committees detailed and analytical study is performed on standardization subjects. When completed, the recommendations of these committees are voted upon by the entire section membership, or in some sections by the voting classification group. The proposed standardization may take the form of an Adopted Standard, Recommended Practice, Suggested Standard for Future Design, or Authorized Information.

When Standardization Proposals Leave the Section

So far, we have discussed the standardization process wholly within a single product group or section, but mind you, all in accordance with NEMA's standardization procedure. From this point on, however, the process is of wider concern than to the section alone. Ordinarily, after a section approves a standard, it goes to the Codes and Standards Committee for action. The Codes and Standards Committee may approve it directly, in which case the proposal then becomes a NEMA Standard and is disseminated in various ways. On the other hand, the committee may foresee interest by other sections, and here is where the real correlation begins. In this instance, the proposal is referred to other sections believed to have an interest for assent. If real differences of opinion develop, the Codes and Standards Committee orders the formation of a Joint Sections Committee.

Any member company is privileged to present standardization proposals for appropriate treatment by the association. Only last week, a member company informed me of an extensive survey he was making on a line of product, with the view of recommending to NEMA the standardization of certain basic features, which he foresaw would be a distinct benefit to everyone concerned. This proposal may reach the ASA. Many companies, whose standardization facilities are limited, have found by experience that their membership in NEMA facilitates their relations with bodies outside of NEMA, notably the ASA. A "cleared channel" exists at all times from the member company straight through NEMA to the national, or even international, body with whom contact is desired.

The internal organization picture just sketched is essential to understand how NEMA carries on its relation with other organizations. Both relations are quite similar in their internal processes.

NEMA, as most readers know, cooperates with many standardization and specification writing bodies, such as, Underwriters' Laboratories, Edison Electric Institute, American Society for Testing Materials, Canadian Engineering Standards Association, and other associations. The degree and kind of cooperation varies to suit the particular conditions as they exist.

In addition, contacts are made with governmental departments. Here, the contact is purely an advisory one and the organization set-up takes the form of a small contact committee, made up of specialists in the particular product under consideration, who are selected from the interested section or sections. This committee conveys the section's views to the governmental department and gives whatever explanation and further comment may be necessary.

Relations With the ASA

In the case of cooperation with the ASA, however, the situation is more formal. Here, NEMA, with other associations, is a party in the establishment of national standards. But it is more than just a party. In many cases, it is the particular party which has to build to the standards established jointly. Naturally, such a relation requires more formal treatment. However, it should not be construed that this in any way acts as a barrier. The manufacturer knows, as does no one else, that unless he keeps his standardization along the lines that are wanted, his life will be short. Standardization to him is a serious matter.

NEMA recommends the appointment of representatives to ASA committees, and like representatives from any other association, they participate in the formulation of the proposed standards. Likewise, when the recommendations are completed, they register votes of approval or disapproval.

Certain standards for electrical products, whether originated by NEMA or by others, have national significance. This fact requires that they should be adopted as "American Standards," that is, they should be approved by the American Standards Association under its established procedures whereby all interested parties may receive a hearing and vote thereon.

Similarly electrical manufacturers are interested in American Standards established for many non-electrical products such as materials or parts, and may voice their viewpoints thereon through NEMA.

All NEMA Sections are afforded full opportunity to review and assist in the development of all "American Standards" in which they are interested, whether for products of an electrical nature or otherwise. Any NEMA Section may originate such standards.—***From NEMA Program for 1939.***

The representatives seek advice from whichever interested NEMA committee or section may be needed to assist them in carrying on their work. On all formal questions, however, they obtain voting instructions from the Codes and Standards Committee. Here, the internal relations of NEMA, mentioned earlier in this article, come into play. The Codes and Standards Committee refers such questions to the interested committees or sections for action, after which it correlates their replies.

NEMA representatives on all outside committees are instructed how to vote. Self-styled rugged individualists would have you believe that this reduces the representatives to automatons, but the writer has no hesitation in saying that, if the extensive analytical study invariably reported by these representatives is any criterion for passing judgment, such accusation is false. The representatives' views are always necessary and constitute a most important factor in the correlating process and in the final instructions. Conversely, NEMA representatives insist on knowing the views of their association, which they regard as vital to the proper execution of their work.

NEMA Standards Are Used by ASA

Many provisions in NEMA standards are used by ASA committees as a basis for drawing up American Standards. For illustration, in the preparation of the ASA Standard for Rotating Electrical Machinery (C50-1936), use was made of the NEMA Motor and Generator Standards, as well as standards from sources other than NEMA. The ASA Standard for Carbon, Graphite and Metal-Graphite Brushes (C64-1935) is identical with the NEMA standards for the same product. The standards for Terminal Markings for Electrical Machinery are identical in NEMA and ASA.

The Staff

Each group of projects is sponsored by a Standing Committee. This committee is responsible for their continued existence and progress. In the case of the 25 standardization projects, the committee is the Codes and Standards Committee, and the corresponding staff organization is the Engineering Department. It is the Engineering Department that carries on the general correspondence, prepares the agenda for meetings, writes minutes, and handles other secretarial details.

Experience shows that members have quite definite ideas on what they want. In general, people are willing to pay for whatever services may be necessary, provided the fulfillment of their ideas is in sight. It only remains for the staff to provide the channels for expression and the "follow-through." Both the organization and the program are means devoted to that end.

ASA Standards Activities

Each month this space will be assigned to the listing of new projects, new standards, drafts of standards submitted to the American Standards Association for approval, or drafts not yet submitted but which are now being considered by ASA committees.

Standards Approved Since Publication of Last List of Standards, February 1

(Where price is not shown, copies of standards were not available at time of publication of this issue. Orders will be received by the ASA and filled when copies become available.)

American Standard Safety Code for Mechanical Refrigeration (Revision of B9-1933) B9-1939 20¢

American Standard Specifications for Welded Wrought-Iron Pipe (Revision of B36.2-1934) B36.2-1939

American Standard Specifications for Electric Fusion-Welded Steel Pipe for High-Temperature Service (B36.11-1939)

American Standard Wrought-Iron and Wrought-Steel Pipe (Revision of B36.10-1935) B36.10-1939 50¢

American Standard Manufacturing Standards Applying to Broadcast Receivers (Revision of C16d-1932) C16.3-1939

American Standard Vacuum Tube Base and Socket Dimensions (Revision of C16c-1932) C16.2-1939

Standards Now Being Considered by Standards Council for ASA Approval

Manual of Accident Prevention in Construction (Revision of A10-1934)

Indicating Pressure and Vacuum Gages

Malleable-Iron Screwed Fittings, 150 lb (Revision of B16c-1927)

Methods of Test for Insulation Resistance of Electrical Insulating Materials (ASTM D257-38) C59.3

Specifications for Rubber Insulating Tape (ASTM D119-38) C59.6

National Electrical Safety Code (C2-Part 4)

New Projects Authorized

Standardization in the Field of Library Work and Documentation (Z39)

New Projects Requested

Protection of Homes and Small Properties from Fire Hazards

Standardization of Voltages Below 100 Volts

Standardization of Coal Stokers

Drafts of Proposed Standards Available

Allowable Concentrations of Carbon Monoxide (Z37)

Mechanical Refrigeration Safety Code

New Edition

represents best and latest approved safety practice for mechanical refrigeration systems in apartment houses, hotels, drug stores, markets, and other commercial and industrial occupancies, places of public assembly, and residences

covers installation requirements, limitations of refrigerant piping, refrigerant valves, refrigerant fittings, and related parts, safety requirements for design, construction, and tests

20 cents

ASA Members are entitled to 20 per cent discount

American Standards Association

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